MODEL AIRPLANE NEWS

8th Year of Publication

DECEMBER
1936
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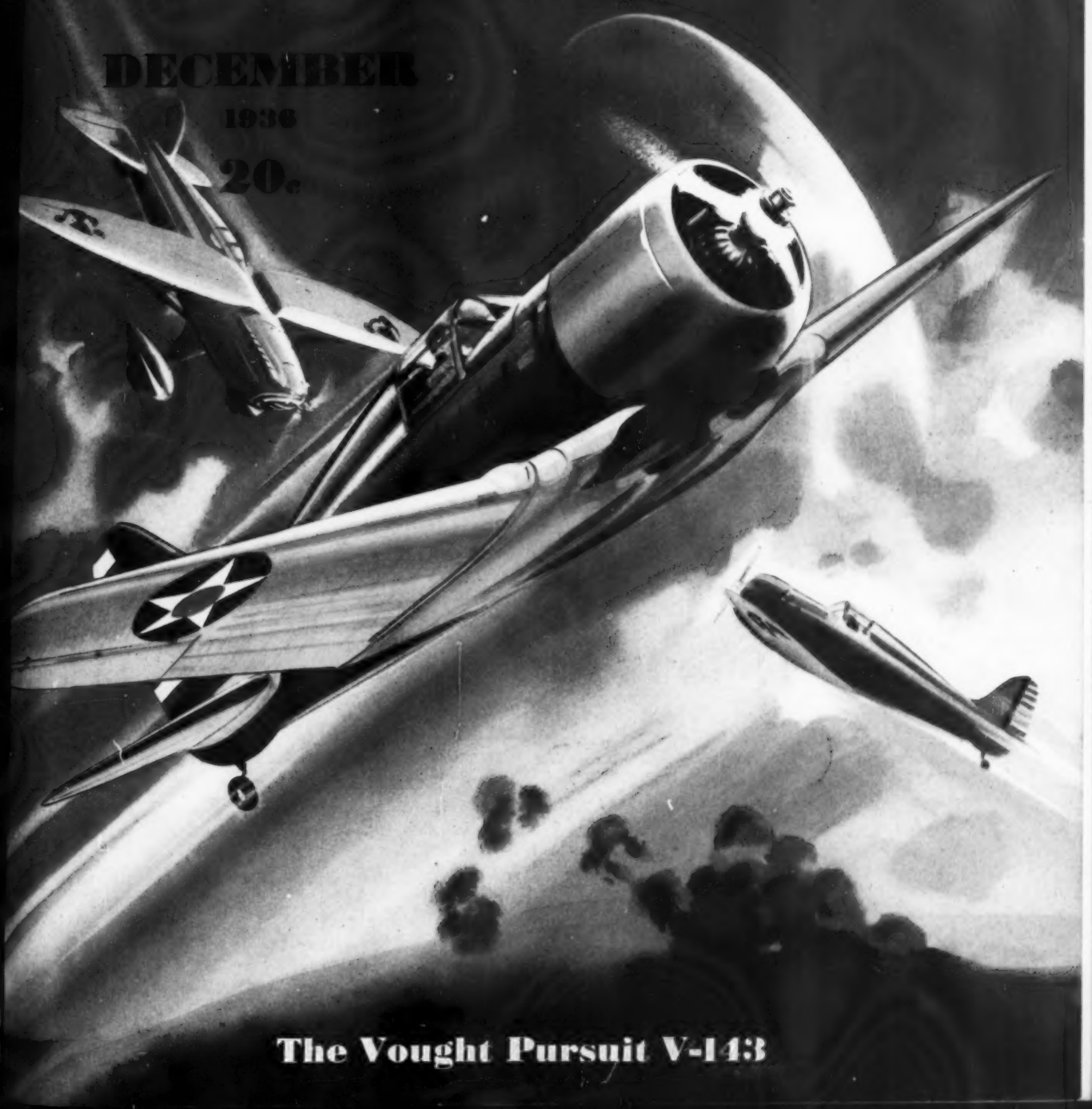

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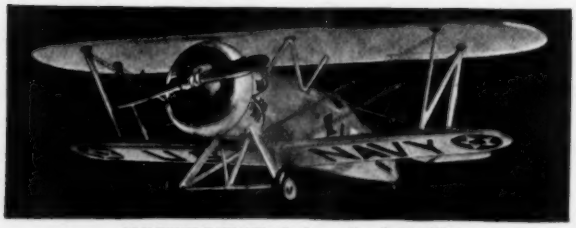

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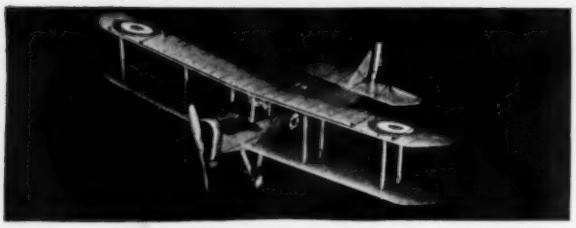

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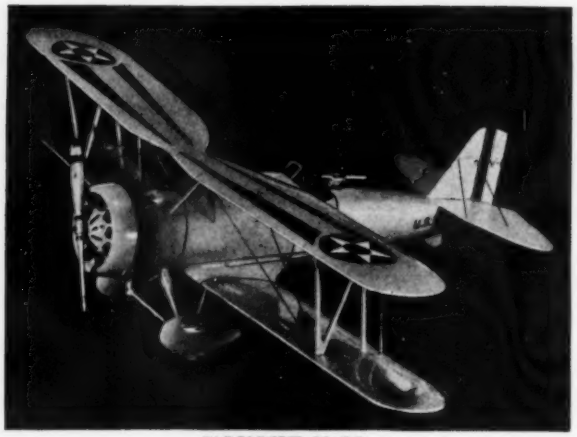

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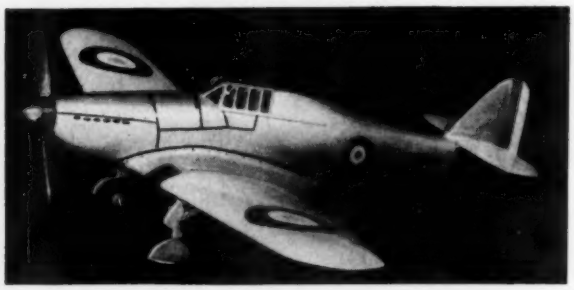

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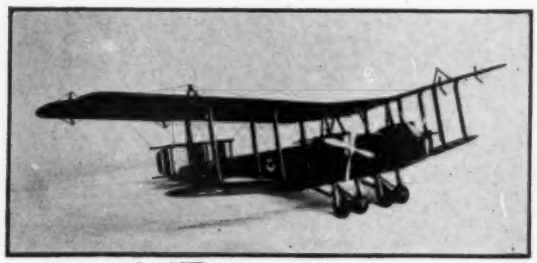

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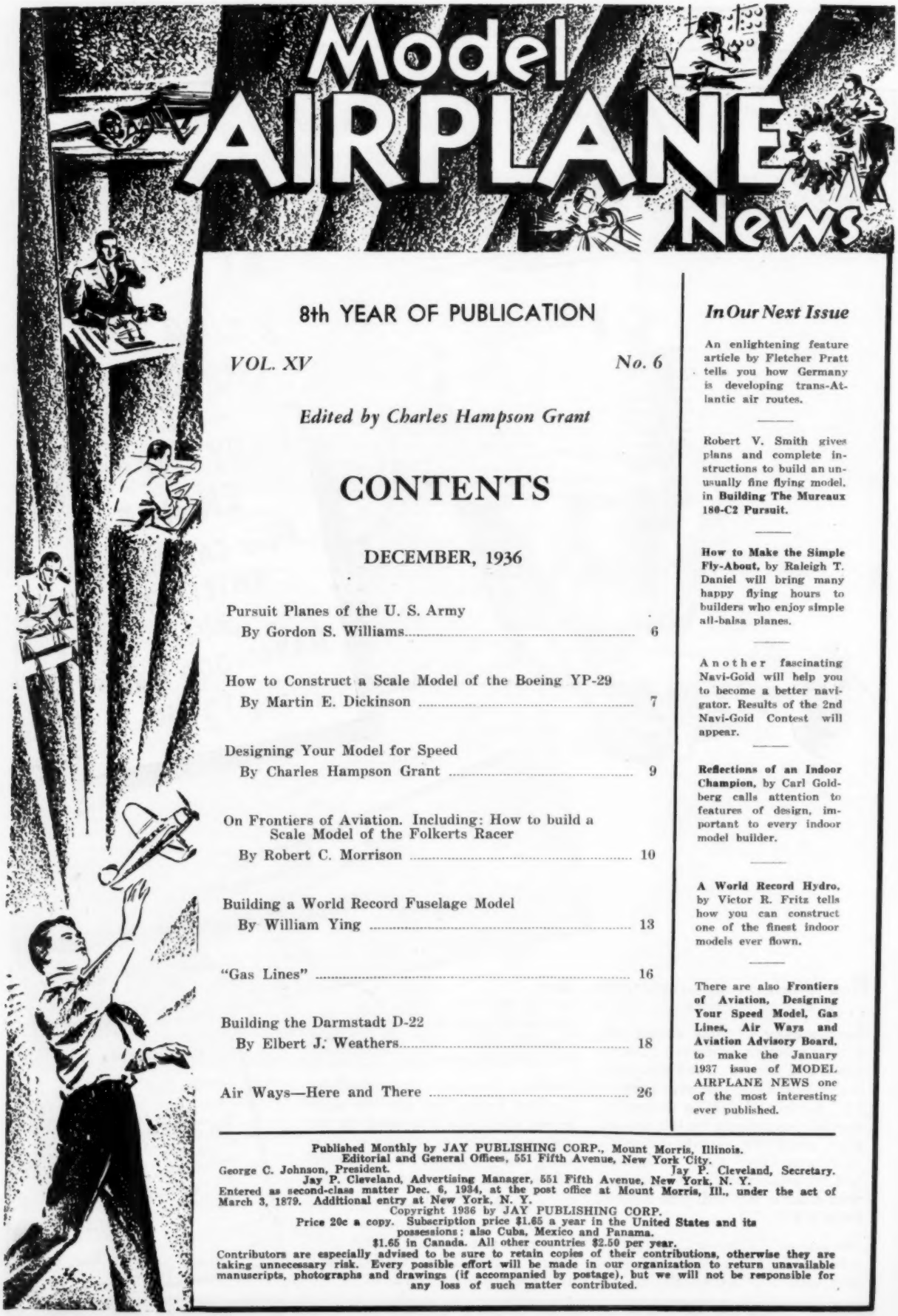

8th YEAR OF PUBLICATION

VOL. XV *No. 6*

Edited by Charles Hampson Grant

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DECEMBER, 1936

In Our Next Issue

An enlightening feature article by Fletcher Pratt tells you how Germany is developing trans-Atlantic air routes.

Robert V. Smith gives plans and complete instructions to build an unusually fine flying model, in **Building The Mureaux 180-C2 Pursuit.**

How to Make the Simple Fly-About, by Raleigh T. Daniel will bring many happy flying hours to builders who enjoy simple all-balsa planes.

Another fascinating Navi-Goid will help you to become a better navigator. Results of the 2nd Navi-Goid Contest will appear.

Reflections of an Indoor Champion, by Carl Goldberg calls attention to features of design, important to every indoor model builder.

A World Record Hydro, by Victor R. Fritz tells how you can construct one of the finest indoor models ever flown.

There are also **Frontiers of Aviation, Designing Your Speed Model, Gas Lines, Air Ways and Aviation Advisory Board,** to make the January 1937 issue of MODEL AIRPLANE NEWS one of the most interesting ever published.

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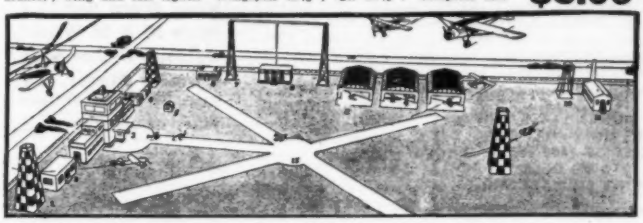

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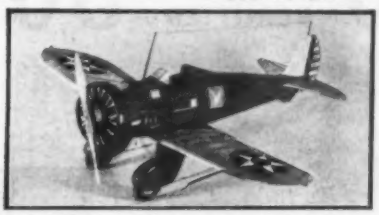

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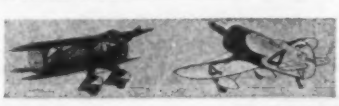

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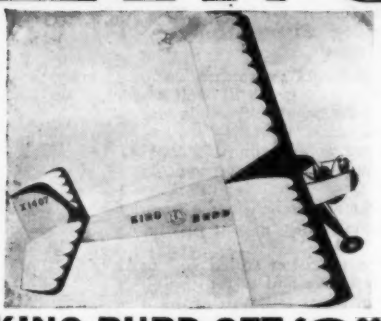

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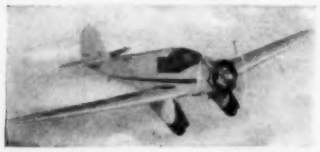
30" BOEING P26A **50c postpaid**

The prize speed pursuit of the Army. The model is an exact replica as you can see from the picture and also makes a speedy flying job. Colored new Army blue and yellow.

30" STINSON SR7 **50c postpaid**

Here is the 1936 sensation in cabin planes. The set is very accurately detailed and certainly looks like the real thing. A long capable flyer that will keep you running.



30" AERONCA C70 **50c postpaid**

This trim low wing crate has caught the fancy of all sportsmen. It's a trim little job and the "BURD" designers have gone to town on it. Comes complete with all markings.

THANX MODELER! IT'S JUST WHAT WE SAY!

Gentlemen: Just a line to let you know that I received my 5 ft. Curtiss Robin okay. I was very much pleased with the kit. I was surprised at the completeness and accuracy of the kit. Never have I seen such high grade balsa for such low priced kit. One thing I like best of all is the size. It is something different. I have been building ¾" scale flying models for some time. You can't get a kit its size anywhere else for that price, as good as that. I've been building models for some time so I should know. . . . Donald Katz.

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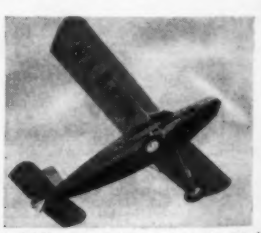

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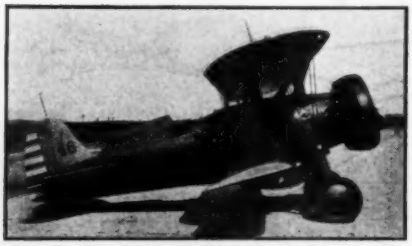
The Curtiss XP-6F supercharged Hawk (Official photo U.S. Army)

The Thomas Morse "Viper" XP-13. A rare ship (Official photo U.S. Army)



The Boeing YP-12K. One of the first pursuits with a fuel injection Wasp engine

An early Curtiss Hawk P-1C pursuit with the radiator under the nose

Curtiss XP-17 Hawk with unusual engine cowling (Official photo U.S. Army)

The Thomas Morse "Viper" XP-13 with 600 hp. Chieftain engine (Off. photo U.S. Army)

Pursuit Planes of

Highlights of Planes That Contributed to the Evolution of the Modern Pursuit Ships

By GORDON S. WILLIAMS

MILITARY aviation is divided into four distinct classes. Of these four, the most interesting and certainly one of the most important, is the pursuit class. The U.S. Army Air Corps has perhaps done more experimental work along the lines of the fast pursuit airplane than has the air force of any other nation. From the first types produced in the late years of the World War to the latest all-metal bullet-like monoplanes, the Air Corps has undertaken to produce aircraft second to none.

Although at the time of this country's entrance into the great European conflict, we had few actual "pursuit" aircraft, we were not long in overtaking the nations of Europe. The recent trend toward the low-wing all-metal type was pioneered by the Air Corps and is now spreading to many other nations. This type fits very well into the military aviation picture and has proved itself to be fast, maneuverable, sturdy and dependable.

Pursuit aviation was one of the last types of aerial warfare to see specialization as it is primarily a "counter-attack" type. Observation was of course the first type to be used in warfare. After this have come attack and bombardment types. Pursuit planes are used, on the whole, as a counter measure against these three other types. Pursuit planes may be subdivided into two main classes, low altitude and high altitude planes. The low altitude ship is designed for most efficient operation close to the earth's surface while the high altitude ship operates at heights from 15,000 to 30,000 feet. Both types are sometimes used for the secondary duties of light ground bombing and strafing as well. The altitude pursuits carry oxygen equipment as well as equipment for electrically heated flying suits. Both types are radio equipped, all with receivers and flight leaders with transmitters.

Many complex problems have presented themselves in designing both the single-place and bi-place pursuits. The two-seater, while possessing the extra protection afforded by a rear gun, is however handicapped by extra weight and size and consequent decrease in performance. It is a fact that the rear gunner, in a two-place pursuit, is in many maneuvers just so much "dead weight." Due to terrific centrifugal forces acting upon the gunner in violent dog fighting maneuvers, he is virtually helpless and at the mercy of his attacker. With power full on, a sharp turn or "pull-out" literally forces him to the floor and renders him wholly unable to defend his ship. While the pilot operating only fixed guns need only push his fingers to fire the guns, the rear gunner must move and aim a heavy machine-gun to keep a bead on the enemy aircraft. Many army men believe the single-seater to be far superior to the two-seater for this and other reasons while some contend the two-seater is a better type than the smaller ship due to its greater armament. Although both types are in use today the single-seater has, as yet at

(Continued on page 40)

Boeing P-26As of the 34th Pursuit Squadron

The Boeing YP-29 (Official photo U.S. Army)

Boeing XP-9. The Army's first all-metal monoplane pursuit ship (Official photo U.S. Army)

The Curtiss YP-23 pursuit. The first all-metal Hawk (Official photo U.S. Army)

the U. S. Army

How to Construct a Solid Scale Model of the Boeing YP-29 Single Seat Pursuit Plane

By MARTIN E. DICKINSON

THREE relative types of this plane were built during the year 1932. The first, the XP-940, was identical to the Xf7b-1 except for the Army color scheme. This machine was later modified and was redesignated the YP-29A. In this state it had an open cockpit with a modified P-26A headrest. It also used a P-26A tail wheel. The next type to appear was the YP-29B. It was the same as the YP-29A except that it had a single flap between the ailerons and used a different type tail wheel. The third and last machine of this series was the YP-29. It may seem strange that this particular type came out after the P-29A and B, but it must have been due to the delay in designing the cockpit enclosure that this type embodied. To be in proper sequence the types should have appeared according to their number. That is:

XP-940 (later made the YP-29A).

YP-29 (inclosed cockpit, flaps and YP-29B tail wheel).

YP-29A (old XP-940).

YP-29B (open pit, flaps and new tail wheel).

After this brief effort to make the different types clear to the reader, we will construct a model of the YP-29.

Fuselage

Probably the best part to start on is the fuselage because all the parts are attached to it. This is made according to the procedure with other scale models. First make the side and top templates and then cut to shape. Next carve the cross-sectional shape, being careful to follow the bulkhead outlines as shown on the drawing. After the fuselage has been sanded it is given a few coats of clear dope being careful to sandpaper between coats. Next, using a sharp knife, carve in all plates near nose and around cockpit. The reason for putting on the priming coats first is so as not to fill up all the detail when the clear dope is applied.

Wings

Next we will make the wings. They are first carved to the shape as shown on the front view. Be very careful while putting in this taper because if it is not done correctly it will ruin the wing when the airfoil shape is carved. After the front taper, next make the wing the shape of the top view as shown on the plan. Now is the time to carve the airfoil section. Great care should be taken in order to make it the proper camber as shown on the drawing. The dihedral angle is optional as the machines have been flown and tested from negative dihedral angle (measured on the top side of the wing) to 4 positive. If the builder so desires, the wing can be left straight across the top and just tapered from the bottom. Score the ailerons in with a sharp knife and paint on two coats of clear dope.

Tail Surfaces

The tail surfaces are made in the orthodox manner. Great care should be taken to make them the right shape. The fillets may be

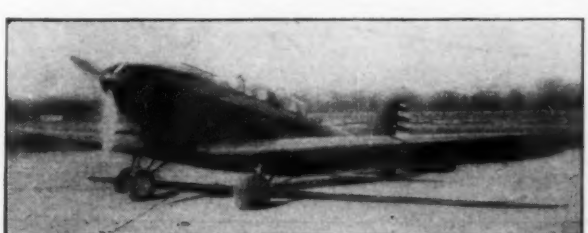
(Continued on page 37)

The rare Boeing SP-12A. Note N.A.C.A. cowling and fuselage fairing (Boeing photo)

The Curtiss YP-20 Hawk. One of the first of its type with pants (Off. photo U.S. Army)

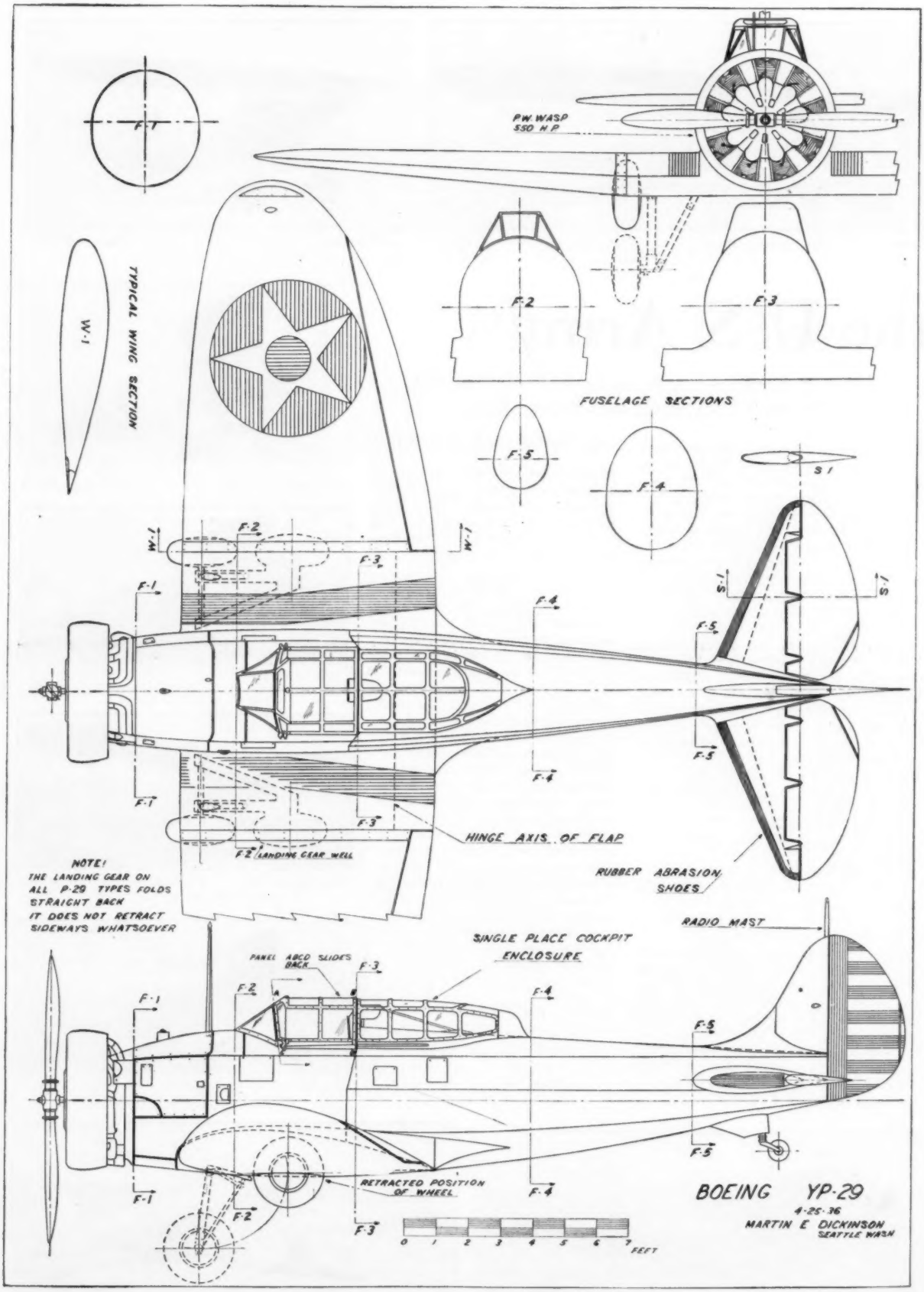
The Curtiss XP-10, unusual because of its gull wings (Off. photo U.S. Army)

The Boeing PW-9D pursuit with a Conqueror engine (Off. photo U.S. Army)

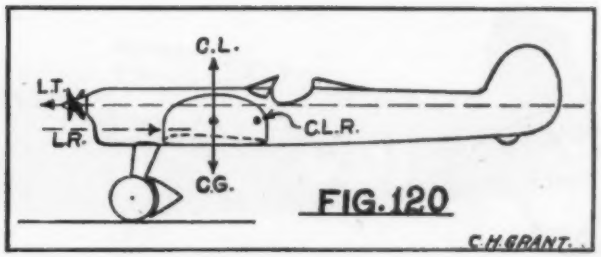


Consolidated YIP-25, forerunner of P-30 (Off. photo U.S. Army)

Two-place Detroit Lockheed XP-24 (Off. photo U.S. Army)


F-1
PW WASP
550 H.P.
F-2
F-3
FUSELAGE SECTIONS
W-1
TYPICAL WING SECTION
F-5
F-4
S-1
F-2
F-3
F-1
F-4
F-5
F-2 LANDING GEAR WELL
HINGE AXIS OF FLAP
RUBBER ABRASION SHOES
NOTE!
THE LANDING GEAR ON ALL P-29 TYPES FOLDS STRAIGHT BACK IT DOES NOT RETRACT SIDEWAYS WHATSOEVER
RADIO MAST
SINGLE PLACE COCKPIT ENCLOSURE
PANEL ABCD SLIDES BACK
RETRACTED POSITION OF WHEEL
0 1 2 3 4 5 6 7 FEET
BOEING YP-29
4-25-36
MARTIN E DICKINSON
SEATTLE WASH

Designing Your Model For Speed



How Proportions of Your Plane Affect Its Performance, and Factors That Develop Speed

Chapter No. 5 By CHARLES HAMPSON GRANT Article No. 57

THE first and most important consideration in airplane design is to create a machine that will remain in *continuous* flight until it comes back to earth when the action of the sustaining power ceases (rubber power or gas engine). The flights of many so called airplanes are terminated prematurely due to inability to combat disturbing forces successfully. In order to have a plane continue in flight for the full duration of the motor run, it must be stable enough to successfully overcome all such disturbing forces encountered during the flight. If a plane comes to earth before the power is fully expended (provided it has sufficient power in the first place), it is due to lack of stability. This instability may be due to improper design or maladjustment of the plane's "surfaces." Thus it can be readily seen that in order to have the airplane fly *efficiently* at all, it must be *stable*. The reader may recall when designing his first model planes that his first great objective was to have them "just fly" and land safely without any thought as to the character of their performance. Consciously or unconsciously the model designer, in such cases, was endeavoring to solve merely the problem of stability.

In the previous articles of this series, the design of a model was discussed and outlined with only this idea in mind; i.e., to create a stable model.

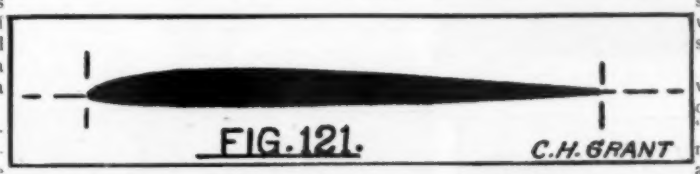
Having solved the difficulties involved in such an enterprise the interest of the designer usually is drawn to the problem of making his model fly as long, as far, as high, or as fast as possible. In other words he is interested in the performance of his ship and he immediately sets to work to determine the characteristics of design that will produce one or another particular type of performance.

Having arrived at this point in our problem of design, let us consider the design factors that influence the performance of a plane and then how they may be used to insure the particular type of performance that may be desired.

The two factors of performance which characterize the flight of a plane are *quality* of performance and *intensity* of performance. A ship may be potentially a speed, duration or distance model, but its aerodynamic inefficiency may prevent it from expressing or carrying out its potential characteristics to any *degree*. Its proportions may give it qualities which will emphasize its suitability for one of these types of performances, but at the same time the relative proportion, size and shape of the features of the model may make it very inefficient. Thus it is obvious that attention must be given to: 1. the position, proportions, size and shape of the parts of a plane, in respect to the type of performance any combination of these will produce and: 2. the degree of aerodynamic efficiency they will induce.

The Speed Model

Suppose we consider the characteristics of design *that will give a model plane great speed, regardless of other considerations such as stability*. In choosing the characteristics of a speed model, speed alone is not the only performance requirement. The ship must fly in an absolutely straight line and not waste valuable time and power by wandering from a straight course or by climbing to a high altitude. It should fly close to the ground so that all of the power will be expended in propelling the model forward, not upward. If the model is of the R.O.G. type (rise off ground) it should get under way quickly and rise from the ground in a very gradual climb to a height not to exceed five or six feet. Now let us see what design characteristics in a model are required for such a flight.



The Wings

It is obvious that any model of given weight will fly faster with a wing of small area than with one of large area, for the large wing gives greater resistance than the small one. With a small wing, a model has to fly faster than with a large one in order to remain in flight, because the weight per square inch of wing area is greater in the case of the small wing. This infers that the span of the wings should be small also if the aspect ratio of the wing is not to be unusually large.

In fact on a speed model the aspect ratio should be as small as possible. There are several good reasons for this. First, the model must fly in a perfectly straight line. In order to have it do this the distance from the wing to the tail must be large in proportion to the wing span. This minimizes the disturbing effects of air currents or bumps that may strike the wing tips and tend to turn the ship out of its straight flight path. The long tail overcomes such forces more completely than a shorter one, while the short wings reduce the moments of these forces about the vertical axis to a minimum.

For efficiency's sake the aspect ratio should be as high as possible, but due to the small wing span, the wing chord should be reasonably large in order to insure sufficient wing area to sustain the plane in flight. Usually an aspect ratio of about *six* is correct for speed planes of the tractor type. An aspect ratio as low as four or as high as eight may be used in some cases. Efficiency is not lost on low aspect ratio wings to a large extent in speed models, for, due to the high speed the end spill at the wing tips is small.

The only reason why a speed plane wing should not be made with a very low aspect ratio is that a very small span does not resist the high propeller torque of a high speed propeller as well as a wing with a medium or large span.

A plane with a very small wing span will be rolled over on its side by the large "torque." An aspect ratio of medium value is therefore advisable.

Speed Wing Section

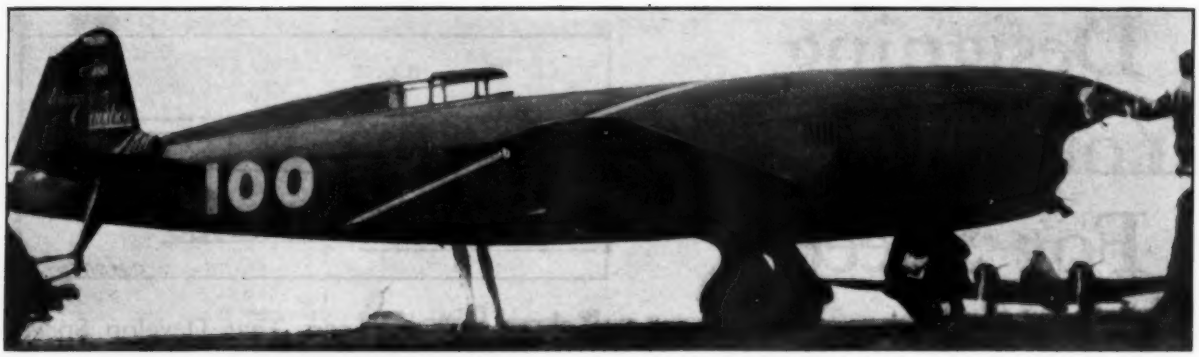
The type of wing section used on this kind of plane is very important. It should be a section that gives very low resistance. *Thin* sections with a negative camber on the under surface which characterizes the "M" sections give best results. Two sections that will serve well for a speed plane are the N.A.C.A. 2406 and the N.A.C.A. 2506. The section shown in Fig. No. 121 is a typical "speed" section.

In order to reduce resistance at the wing tips, the tips should be well rounded and the thickness of the section should be tapered down to a knife edge. An elliptically shaped tip is advisable.

General Proportions of a Speed Plane

The tail moment arm of a speed plane should be long in proportion to the wing

(Continued on page 38)



The Caudron-Renault French racer that swept the races with a speed of 301 m.p.h.

A Detailed Account of the National Air Races and the Planes That Participated

On Frontiers

By ROBERT C. MORRISON

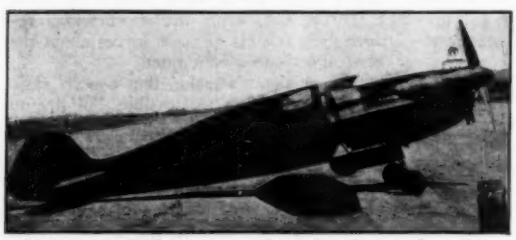
MISFORTUNE certainly dogged the racing pilots at the 1936 National Air Races at Mines Field, California. "Jacky" Cochran's Northrop was the first to be eliminated by a series of crack-ups. The Army would not let Major de Seversky fly his new single-place pursuit in the trans-continental Bendix speed dash. Roscoe Turner smashed his famous Wedell-Williams and his new Lawrence Brown 400 m.p.h. racer was not completed in time for the Bendix. Nor was Frank Hawks' new plane that is being built at the former Gee Bee plant. S. J. Wittman's D-12 powered 1935 second place Thompson winner burned to the ground at Cheyenne, and his Chief Oshkosh crashed into a Northrop at the races. Gar Wood's Northrop fell apart with Joe Jacobsen at the controls. Joe survived only to crack up once more in Benny Howard's "Mike". Jacqueline Cochran's second plane crashed on a test flight. It was Vance Breese's revamped racer. Her third plane, the famous Q.E.D., also took part in a forced landing conducted by Lee Miles, but no damage was done. Benny Howard's "Mister Mulligan" ended its career when the propeller snapped towards the end of the Bendix Race. R. A. Kling plowed into a pylon with his Kieth-Rider and was only slightly hurt. To add to the crack-ups, a Boeing Navy fighter and a Waco collided on the Mines Field runway and both planes were demolished. In spite of the many accidents, no one was killed in the airplanes, though Benny Howard and his wife, Maxine, were badly hurt.

Unfortunately, L. C. Faulkner, the only fatality, was killed during a parachute jump when his shrouds tangled in front of the grand stand.

Many other racing planes did not appear for one reason or another. W. O. Buchanan's fast plane was not completed in time. It was to be powered by a Miller engine with the pilot sitting well in the rear of the fuselage. Neither George Haldeman's Bellanca revamped Swoop nor his reported 375 cu. in. entry made an appearance; nor was Tony LaVier there in his rebuilt Bushey racer.

Eddie Allanbaugh had a new tapered wing built on his minute racer but his Argus engine which was just installed in the plane would not function properly and the little ship never participated in any of the events. He is now contemplating putting a Menasco engine in the airplane for next year's races.

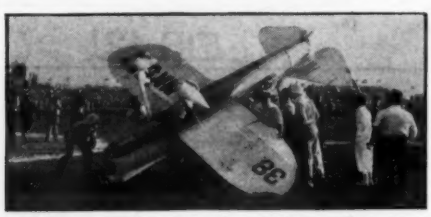
However there is plenty of time to get all these racing ships in good condition for the 1937 races.



Neumann's Folkerts racer that placed second to the French Caudron, powered with a 4 cyl. Menasco

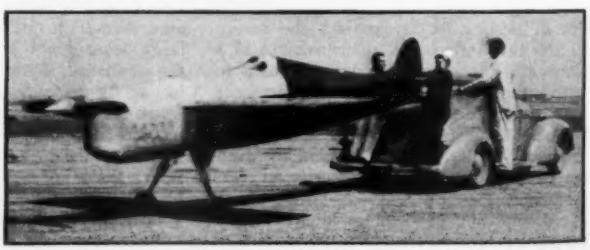
Harry Crosby in the seat of his all-metal racer before the first test hop

The new Brown B-3 sport plane equipped with Handley Page slots and flaps

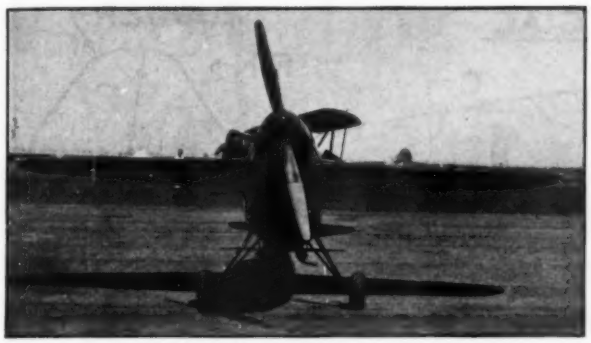


The crash of Joe Jacobsen's Howard racer "Mike" (Photo by McReynolds)

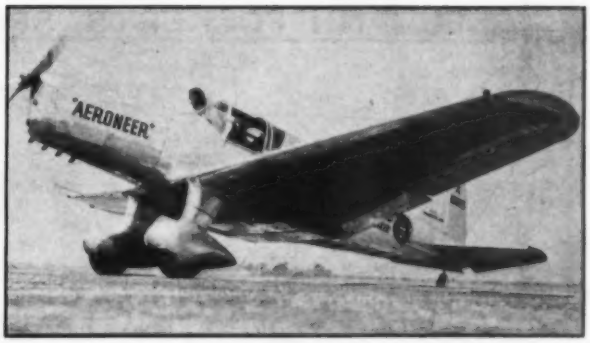
The Loughran sport plane with an all-metal fuselage powered with a Martin engine. Note the clean fuselage lines



S. J. Wittman's Chief Oshkosh which crashed into a Northrop in its second race (4 cylinder Menasco)



Front view of Harold Neumann's Folkerts racer



The 150 m.p.h. Aeroneer all-metal sport plane

# of Aviation

How You Can Build a Scale Model of Harold Neumann's Folkerts Racer

Though many of the expected planes were absent, the National Air Races were by no means a failure or a disappointment. There were many surprises. Harold Neumann's small mid-wing craft performed remarkably well. It is without doubt the fastest racing plane in the world for its class. In the Shell Trophy Race, Neumann established a new speed record for the 375 cu. in. displacement class, of 223.2 m.p.h., winning a purse of $3,400. On the straight-away the plane should do 250 m.p.h. plus.

Clayton Folkerts is the designer of the ship. A four cylinder Menasco is the power plant. A novel landing gear retracts into the belly of the long fuselage. The short, thin, tapered wing joins the fuselage on the line of thrust. Large wing flaps are employed, giving the swift racer good landing characteristics. The entire fuselage is built of steel tubing with fabric covering and is of very light construction. A sheet metal cowl encloses the small engine. The wing is covered with plywood, giving it very sharp lines and making it very durable for pylon turns. A wooden propeller was used.

Neumann flew a race close to the ground, diving after each pylon turn and skimming a few feet from the earth to get as much speed as possible out of the ship. Harold said his engine was not working at its best during the races even though it ran remarkably well considering the beating it took by performing in every race, so more speed is expected to be obtained from it. The plane's closest rival was Art Chester's familiar "Jeep" which has been a consistent money winner for many years. The "Jeep" at no time was very far behind Neumann.

S. J. Wittman's old "Chief Oshkosh" carried a new four cylinder Menasco in its nose and showed a surprising burst of speed. It kept well up in front and turned the pylons exceedingly well. Unfortunately a conked engine in its second race forced Wittman to land. He misjudged his distance to the field and landed atop one of the many Northrop A-17 attack planes that was at the field. The pilot was not hurt and surprising enough the ship was only slightly damaged.

Roger Don Rae and Dave Elmendorf had racers that were almost identical in design. They were a creation of Kieth-Rider and resembled Rudy Kling's Kieth-Rider which participated in last year's races as well as this year's. The three planes were very fast. Elmendorf finished his job just before the races began and was not able to get the bugs out of his plane until the last day when he fortunately placed in the money. Roger Don

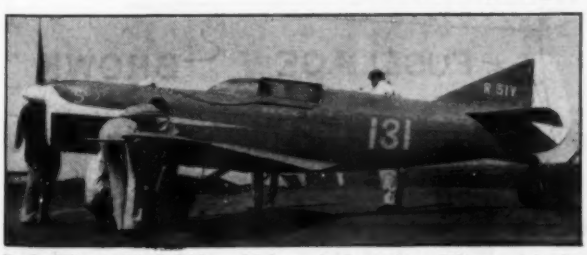
(Continued on page 29)

Miles Atwood's "Miss Tulsa" that lagged behind because of engine trouble

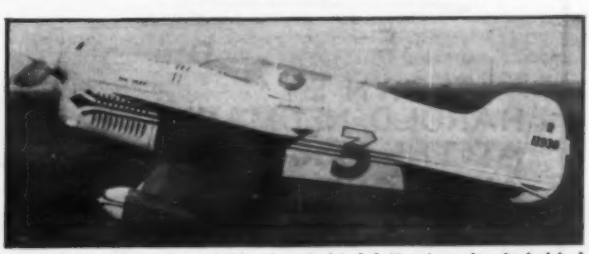
Roger Don Rae's Kieth-Rider, the fastest Menasco powered racer at the races

Gerd Acheglis' Focke-Wulf stunt plane with small 6 cyl. Argus engine

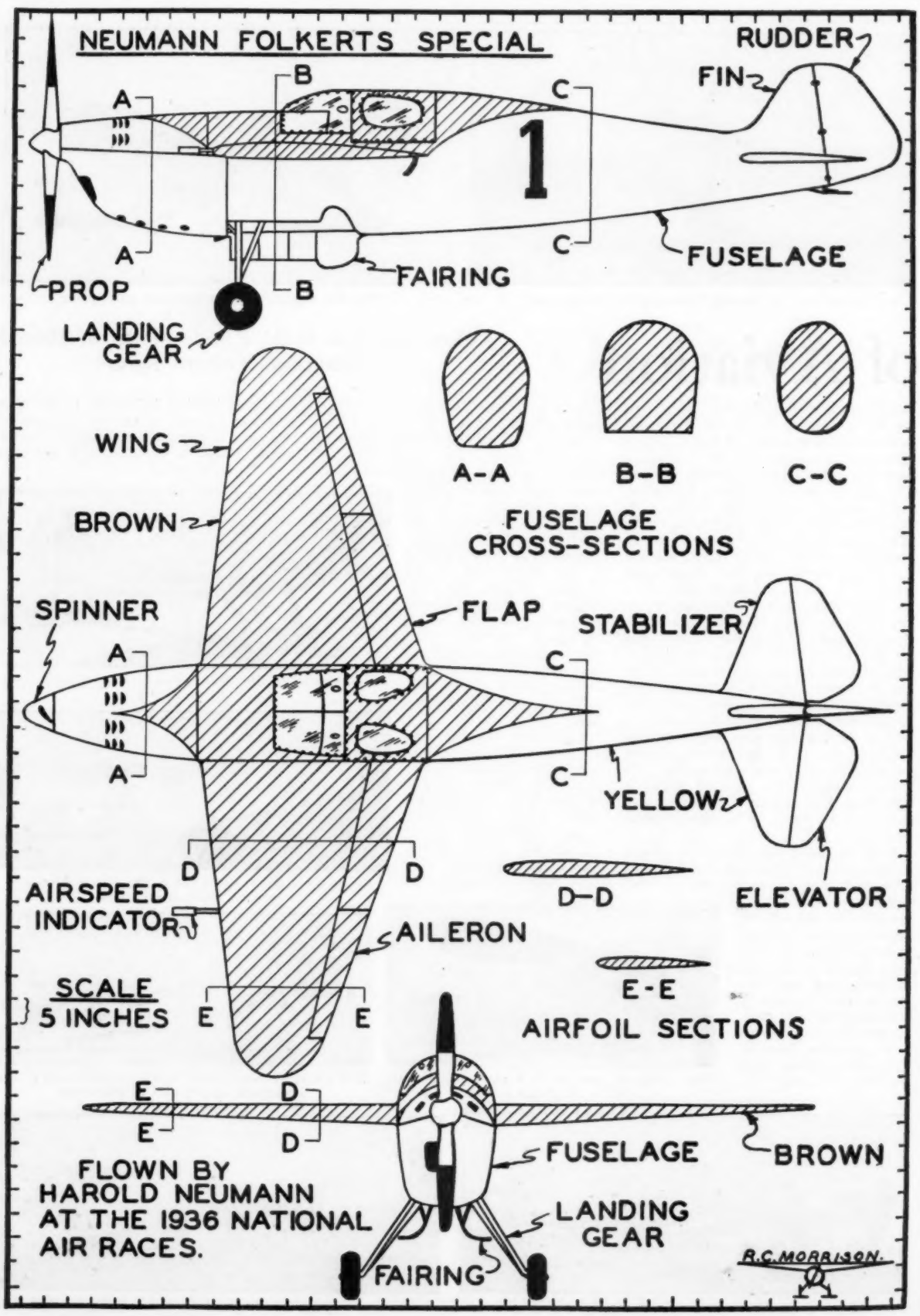
Earl Ortman's Kieth-Rider which placed second in the Thompson Trophy race at 246 m.p.h.



Rudy Kling's Kieth-Rider which crashed a pylon. Kling survived. (6 cylinder Menasco)



Art Chester's "Jeep" which placed third following closely behind Neumann's Folkerts


NEUMANN FOLKERTS SPECIAL
RUDDER
FIN
A
B
C
1
A
C
FUSELAGE
PROP
FAIRING
B
LANDING GEAR
WING
A-A
B-B
C-C
BROWN
FUSELAGE CROSS-SECTIONS
SPINNER
FLAP
STABILIZER
A
C
A
C
YELLOW
D
D
D-D
ELEVATOR
AIRSPEED INDICATOR
AILERON
SCALE
5 INCHES
E
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AIRFOIL SECTIONS
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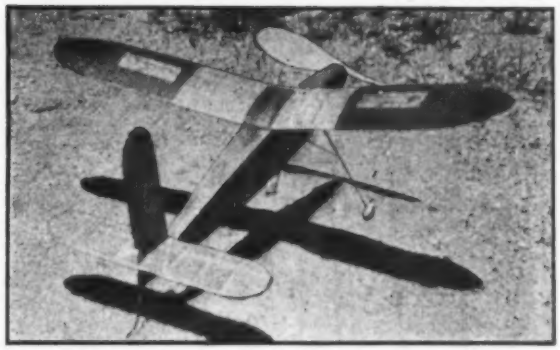
E
D
FUSELAGE
BROWN
FLOWN BY HAROLD NEUMANN AT THE 1936 NATIONAL AIR RACES.
LANDING GEAR
FAIRING
R.C. MORRISON.

Building a World Record Fuselage Model

How You Can Build and Fly the Model With Which the Author Established a World's Record of 41 Minutes and 19 Seconds



The finished model ready to fly portrays excellent flying proportions and grace

By WILLIAM YING

IN THE year of 1935, my ambition was to construct a model plane which would perform well enough so that I could enter the Eastern States Model Meet at Hadley Field, N.J.

After having gone through my pile of magazines and books, I took out some MODEL AIRPLANE NEWS containing many helpful articles. From these books, I obtained much useful information which I used to design this class D fuselage model.

The model has 198 square inches of wing area and meets all N.A.A. requirements and also the Wakefield International contest. The model was completed in the early part of April, 1935, and a few trials were made on the same day. The best time was 13:16 seconds and it flew out of sight but it was retrieved later in the afternoon.

On April 27, 1935, I entered the class D model in the Lyndhurst High School Meet at Teterborough Airport, N. J. Three trial flights were made and the third one got away with a flight of 13:36 seconds. A chase was given and later in the afternoon, the model was retrieved again several miles away from the field. But, while getting the model off for an official flight, the motor stick snapped, thus ending any further flights.

On May 25, 1935, I was ready again with the same model to enter the Eastern States Model Airplane Meet held in Hadley Field, N.J. The model was prepared with an extra strong motor stick.

At the field, no test flights were made, for I knew it would take the air because it was so proven twice. The model was set up and checked by the judges, then placed in the car until it was ready to make flights.

Later in the morning about 11:30 A.M., the class D model was taken from the car for an official flight. It was glided and satisfactory results were obtained. Mr. Le Roy Boshen, my timer, was on hand and we were all ready for the flight. My assistant, Ted Hoffmann, helped me wind up the motor. 650 turns were given. The model was then placed on the gas model ramp for the take-off.

My hands were off the model, and up she climbed, higher and higher to the waiting sky as it spiraled with the torque. In about 5 minutes, the model was well up in the heaven and we decided to start after it in an automobile. We did until we were held back by the railroad tracks about two miles away from the airplane field and this stopped us from going further.

Mr. Boshen kept the model in sight with his field glasses.

The model finally disappeared into the blue sky and the stop watch recorded 41 minutes and 19 seconds. This broke Vernon Boehle's 8½ minutes record and a new one was set.

Before we go on with the construction of this model, I want to express my sincere gratitude to Mr. Boshen, Mr. Rouse, Ted Hoffmann and many others for their kind co-operative work.

The record model in actual flight at the Eastern States Contest

CONSTRUCTION

Fuselage

Enlarge the plans to full size and tack them to a soft working board similar to the drawing board. Place 1/8 square longerons along the outline of the fuselage side. Use pins wherever is necessary to hold the shape. Cut the vertical members in proper lengths and cement them on. The other half of the fuselage is made in the same manner.

When the 2 sides are completed, cut the cross members, having 2 of each, one on the top and one on the bottom. Cement the members on to the 2 sides of the fuselage at the widest point, and gradually work toward the rear end. Also use pins to hold members in place while cement is drying.

After the whole fuselage is finished, round off the longerons with sandpaper slightly before putting on the landing gear.

Landing Gear

Take a piece of 1/16x¼x9 bamboo and taper it from 3/16 to 1/8. Then streamline and sandpaper. The rear struts are made of 1/8x3/32x8, they are also streamlined. Make 2 of each of the same dimensions.

A piece of .040 music wire is bent to shape for the central shock absorber. Then assemble with the rest of the bamboo struts. The 9" struts are inserted in the lower longerons at former No. 3 and the 8" at No. 4. Cement well and assemble the whole outfit with thread and cement.

The wire axles are bent from .034 music wire and bound with thread at the tapered end of the 9" struts and cemented. Put a 1¾" pr. of wheels on the axles and bend up the wire to prevent from falling off.

Motor Stick

Select a soft piece of balsa size 3/16x⅜x25 and shape it as indicated on the plans. Cover the 4 sides with hard 1/32 sheet balsa and dope them. Use 10 rough sandpaper if possible to finish the stick and then cement the rear hook on.

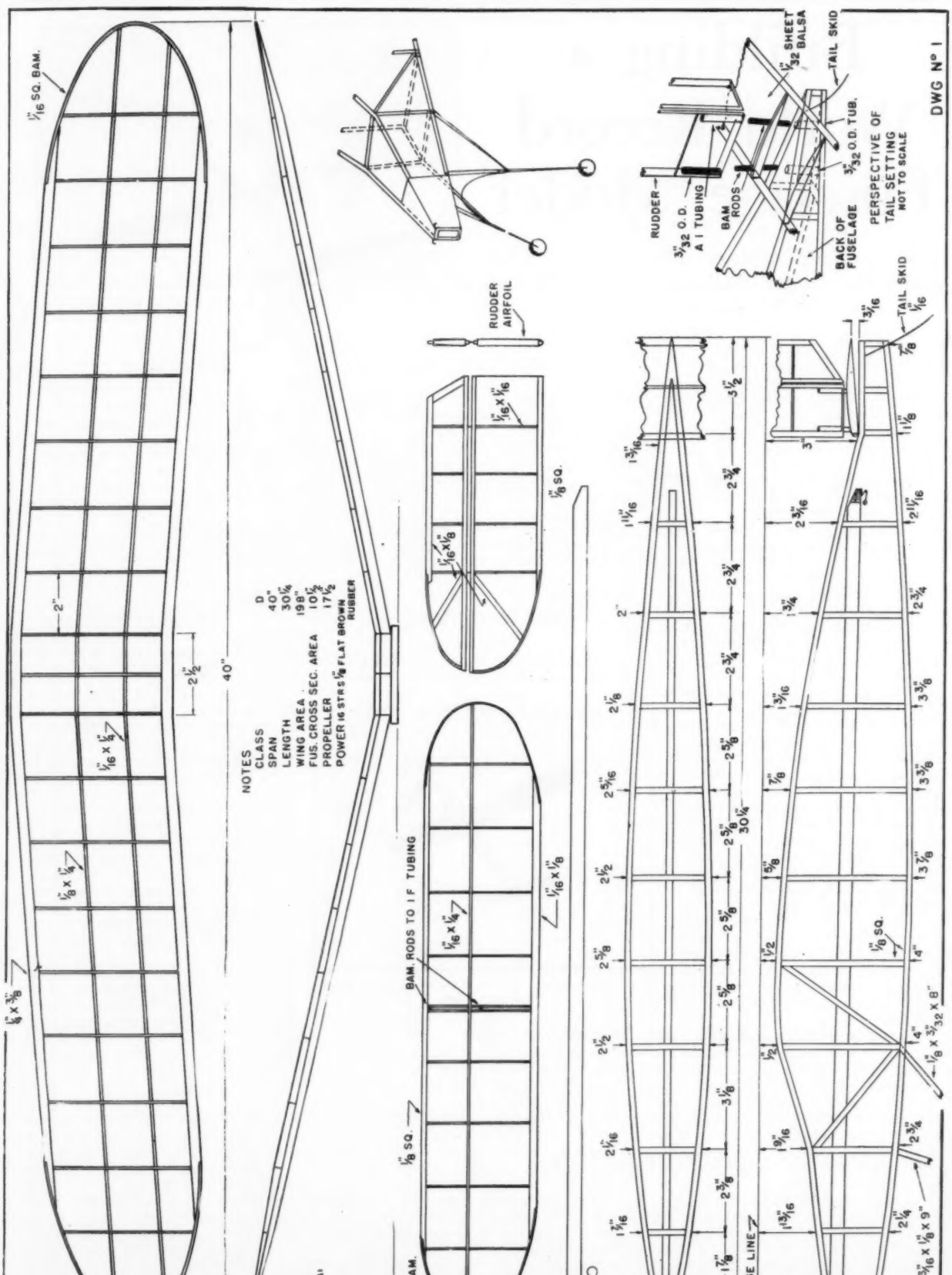
The nose block or plug is made from a hard piece of ¾x1x2⅛ balsa. Take a sharp knife and cut it to shape. Sandpaper it smooth and drill a hole large enough to fit the bushing and at the same time having the thrust-line pointing to 1/8.

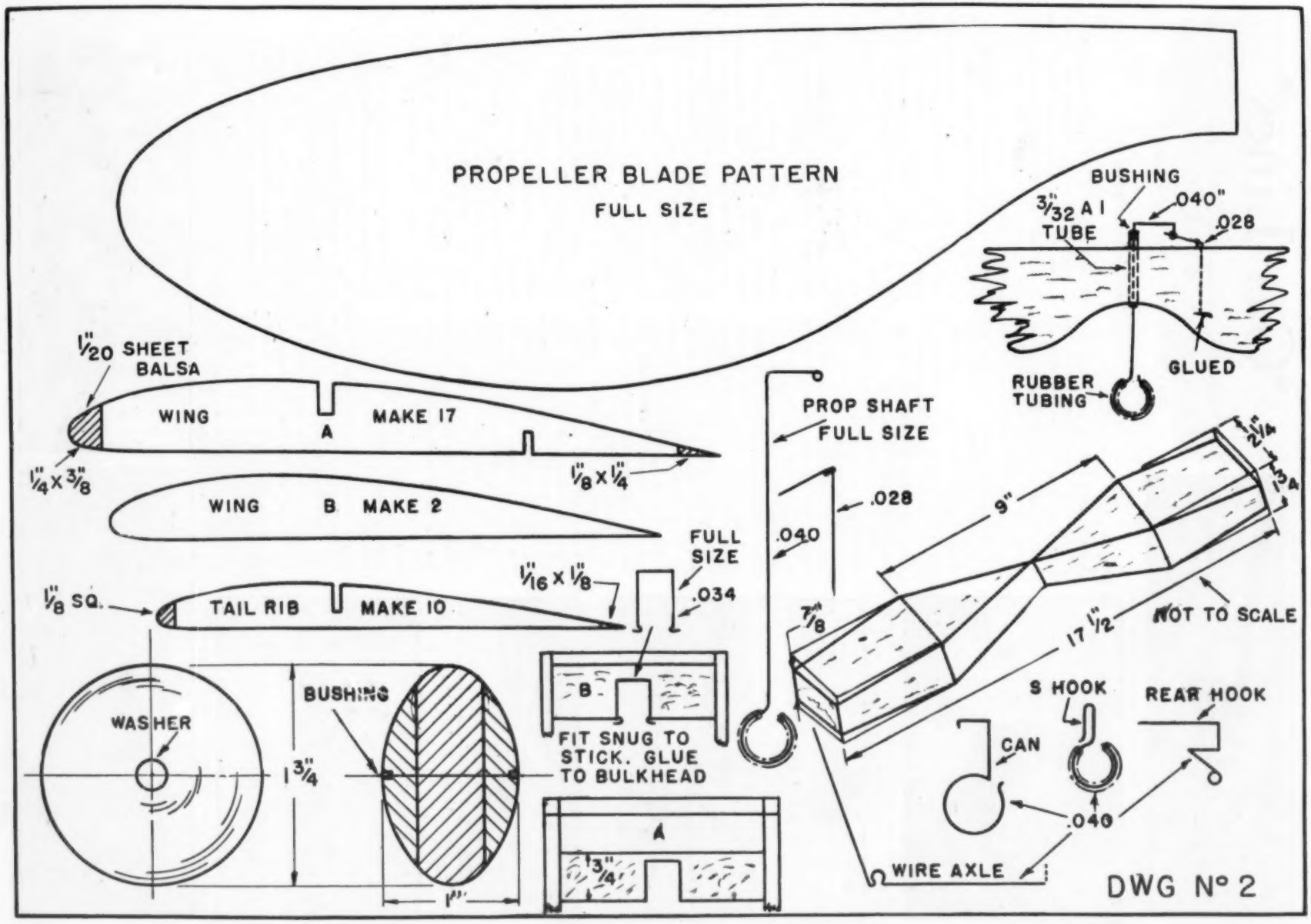
With the point of a sharp knife, cut a little groove in the nose plug to fit the motor stick snugly. Before cementing the stick on, place it in the fuselage just far enough to stick out from the front in order to receive the plug. By doing this, you will prevent the nose plug from being poorly fitted. When they are on, and cemented, remove them and retouch where necessary.

Wing

17A and 2B ribs are cut from 1/20 sheet balsa. Then pin down the ¼x⅜ leading and the 1/8x⅜ trailing edges. Cement the ribs in their proper places and add the required spars. The top spar is 1/8x¼ and the bottom one is 1/16x¼. 1/16 square bamboo wing tips are formed with an electric iron or still better an electric soldering iron and then they are cemented at each end of the wing. The center section of the wing is made in the same manner by pinning down the leading and

(Continued on page 32)


DWG N° 1
1/16 SQ. BAM.
40"
2"
2½"
1/16 x 1/4
1/8 x 1/4
1/8 x 3/8
NOTES
CLASS D
SPAN 40"
LENGTH 30¼"
WING AREA 198"
FUS. CROSS SEC. AREA 10½"
PROPELLER 17½"
POWER 16 STRS 1/8 FLAT BROWN RUBBER
4" DIHEDRAL
1/16 SQ. BAM.
1/8 SQ.
BAM. RODS TO I F TUBING
1/16 x 1/8
1/16 x 1/16
RUDDER AIRFOIL
1/8 SQ.
BASE LINE
30¼"
TAIL SKID
1/16 x 3/32 SHEET BALSA
RUDDER
3/32 O.D. A 1 TUBING
BAM RODS
3/32 O.D. TUB.
BACK OF FUSELAGE
PERSPECTIVE OF TAIL SETTING NOT TO SCALE
1/8 SQ.
1/8 x 3/32 x 8"
3/16 x 1/8 x 9"


PROPELLER BLADE PATTERN
FULL SIZE
1/20 SHEET BALSA
WING A MAKE 17
1/4 X 3/8
1/8 X 1/4
WING B MAKE 2
1/8 SQ.
TAIL RIB MAKE 10
1/16 X 1/8
FULL SIZE
.034
WASHER
BUSHING
1 3/4
1"
B
FIT SNUG TO STICK. GLUE TO BULKHEAD
A
3/4
BUSHING
3/32 A I TUBE
.040"
.028
RUBBER TUBING
GLUED
PROP SHAFT FULL SIZE
.028
.040
7/8
9"
2 1/4
1 3/4
17 1/2
NOT TO SCALE
S HOOK
REAR HOOK
CAN
.040
WIRE AXLE
DWG N° 2

"Gas Lines"

News and Ideas from Gas Model Builders From All Parts of the World. Twin Motors and Swept Back Wings On Gas Models

Mel Anderson's twin Cyclone model

Joe Kovel and the original KG. After three years it is still flying

Don Donahue and his "high thrust" model of perfect design

A Cavalier by Harold Rumple, a fine streamlined job

A 48 inch span gas model by Raymond Heit

I.G.M.A.A. News

GAS model building and flying takes another leap forward this month. One of the contributing factors to this advance is the successful production and flying of a twin motor job by Mel Anderson of 827 East Chevy Chase Drive, Glendale, Calif. The little ship is shown in picture No. 1. Several gas model builders have been experimenting with this type of ship but this is the first definite news and pictures of such a ship that we have received. Mr. Anderson writes as follows:

"The model has an eight foot wing spread and is powered by two Baby Cyclones. Complete with the two motors it weighs about seven pounds. On the first test hop the ship took off beautifully and flew in large left circles. After this about ten flights were made without a scratch on the ship.

"A gas tank is employed behind each motor. One 4½ volt radio 'C' battery supplies the ignition. The model was built three years ago before the advent of small engines and was originally powered by a large motor of my own make. By changing the nose and mounting the brackets the two engines were easily installed."

Mr. Anderson is fortunate in having a remarkable place to fly. Many other model builders also use this spot, which is "Muroc Dry Lake," a wasteland flat as a table, five miles wide and ten miles long. There are no obstructions of any kind. Truly a gas model fliers' paradise! If Mr. Anderson gives out much more information of this nature he will be having all the gas model builders moving out to California.

In case model builders do not recognize the young man with the plane in picture No. 2, we will tell you that it is Joe Kovel with the original KG which was designed and built 3½ years ago. Joe lives at 52 Taft Street, Stratford, Conn. This ship is commonly known as the "flying box-car." However, regardless of its angular characteristics the KG has given a good account of itself in every contest in which it has been entered. The strange part of it is that this ship was not designed as a contest ship by Mr. Grant, but as an experimental plane which would be unusually stable. Efficiency was sacrificed for stability. It appears that the extreme stability actually makes the ship efficient. This is due to the steadiness of the flight.

The ten foot KG at the present time holds the world record for flying with a limited amount of fuel. The time is one hour, four minutes, forty seconds, which was established in May, 1935. Another thing about the KG that many builders may not understand is that this job was designed and stressed for 1/3 to ½ horsepower engine. Much better results will be obtained with this ship if an engine of this power is used instead of with motors of the lighter variety.

The White Plains unit of the Westchester Model Club recently built a KG powered with a Forster Brothers engine. The results were very gratifying and the performance was increased considerably over that put up by the ship when a lighter engine was used.

We are indebted to Mr. Andrew Borysko for this picture.

Picture No. 3 shows one of the best designed ships, bar none, that we have ever seen. Its builder, Don Donahue of 5906 Tipton Way, Highland Park, Calif., is shown in the picture. Many model builders will gain some helpful information by observing the set-up of this ship. The wings are slightly parasol, the thrust line is high and the center of lateral area or the area of the fuselage is low. This set-up should make for exceedingly steady flights and few crack-ups. We might say it is an example of perfect design. Donahue makes some interesting comments on his experiences while flying this ship. It shows some of the causes for not winning contests. He says:

"I have entered this model in a number of contests in Southern California, which are as follows:

"In the Gotch contest for precision flight it took 44th place because I forgot about the timer and it flew out of sight in ten minutes. In the San Diego contest for workmanship and duration it won the trophy for best workmanship and design, but I had motor trouble and it failed to place in the duration event. It won twelfth place in the

Not a real ship: Just a KG landing

The first Canadian gas model contest

Two gas jobs at a "Gotch" contest

The "flying circus" of Unit No. 1

second Gotch contest for precision. It won first place for design, workmanship and finish in the Fullerton contest, but it did not fly as the field was too small. In the Redlands contest it hit a telephone pole at the beginning of the meet. No more need be said concerning this.

"However, in the Long Beach contest it finally broke the jinx, and totalled 89 points for design, workmanship and flying characteristics.

"The motor was built by Owen Chapman and the complete motor, coil, batteries and condenser weigh only eleven ounces when installed in the ship and ready to fly."

It is interesting to know that the majority of gas contests in California are for precision flying rather than duration. The models are judged 20% for design, workmanship and engineering; 20% for take off; 20% for flight; 10% for motor cut out between twenty and forty seconds; 30% for the landing and its distance from a designated spot. This spot is located at the center of a number of concentric circles and the model is given maximum points if it lands at the center of these circles. The models are usually flown twice and the average of the two flights is counted as the final score.

Now on the opposite side of the page, in picture No. 4, you will see a model similar to Donahue's ship in most respects except that the thrust line is very low. It is built by Kenneth E. Frandsen of 2226 Fairview Street, Anderson, Indiana. Frandsen does not tell us anything concerning the flights made by this ship. However we wish to remark for his benefit and possibly the benefit of others, that his ship would be a perfect job if the thrust line was raised to the top of the fuselage instead of having it located at the bottom. The reason for this is that in such a ship the center of gravity is usually below the center of lateral area which would produce a tendency for the ship to tighten up into a spiral when it starts to make a sharp turn. If such a ship can be constantly kept in a flying position and flown at slow speed, this will not occur. However, when making a turn at high speed this type of ship is always liable to end up with a crash.

The workmanship on Mr. Frandsen's job is excellent.

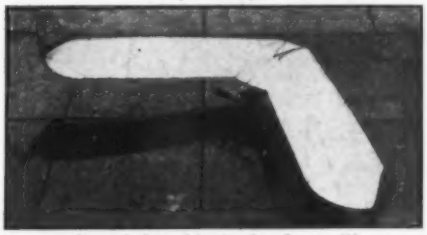
We give you another interesting ship in picture No. 5. This picture shows a four foot gas job of Raymond Heit, who lives at 1157 45th Street, Brooklyn, New York. Model builders have been trying continually to reduce the size of their models and have them possess good flying qualities and general ability. Heit's job is one of the smallest models that has been built. We understand that it is under 300 square inches and exceedingly fast in consequence. Heit belongs to unit No. 7 of the I.G.M.A.A. which is the New York chapter of the Metropolitan Model League, led by Mr. Irwin Polk.

One of the most streamlined jobs that has been produced is a Cavalier. Picture No. 6 shows one of these ships built by Harold A. Rumple of 215 Green Avenue, Lewistown, Pa. It is the third one which he has built but the first to fly successfully. So far Rumple has made about ten flights with this job. Rumple says that the gas job shown in the background was built by Bill Knepp, also of Lewistown.

In experimenting on this ship Knepp used a smaller rudder in combination with more dihedral than specified, and the ship has been more successful with this. We do not know whether this change was promoted by chance or real thought. However, it is indicative of the realization of a very important point in model design. By increasing the dihedral and reducing the rudder area any ship will have less tendency to fall in when turning. In other words this helps to keep the nose up and have the ship right itself quickly from a turn or a side roll. The reason for this is that the tail swings toward the direction of the turn and in this manner swinging the ship so that a greater angle of attack is presented by the lower, well dihedraled wing. This action corrects the balance of the ship

(Continued on page 45)

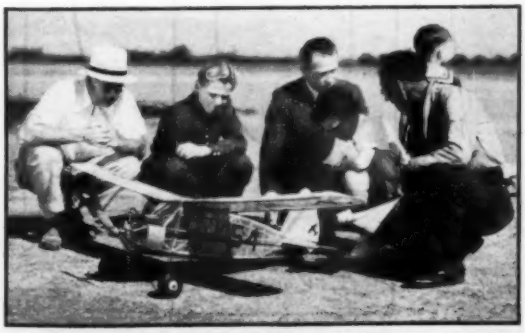
Ken Frandsen's low thrust line gas model; a very clean job



To our knowledge this is the first tailless gas model in America that flies. By Andrew Borysko

E. R. Guth's KG which won the New York State Fair contest

Timofei Balashev of Russia tunes up his benzine motor



Hollywood goes gas minded

Mr. Leo Rutledge explains to interested "fans"

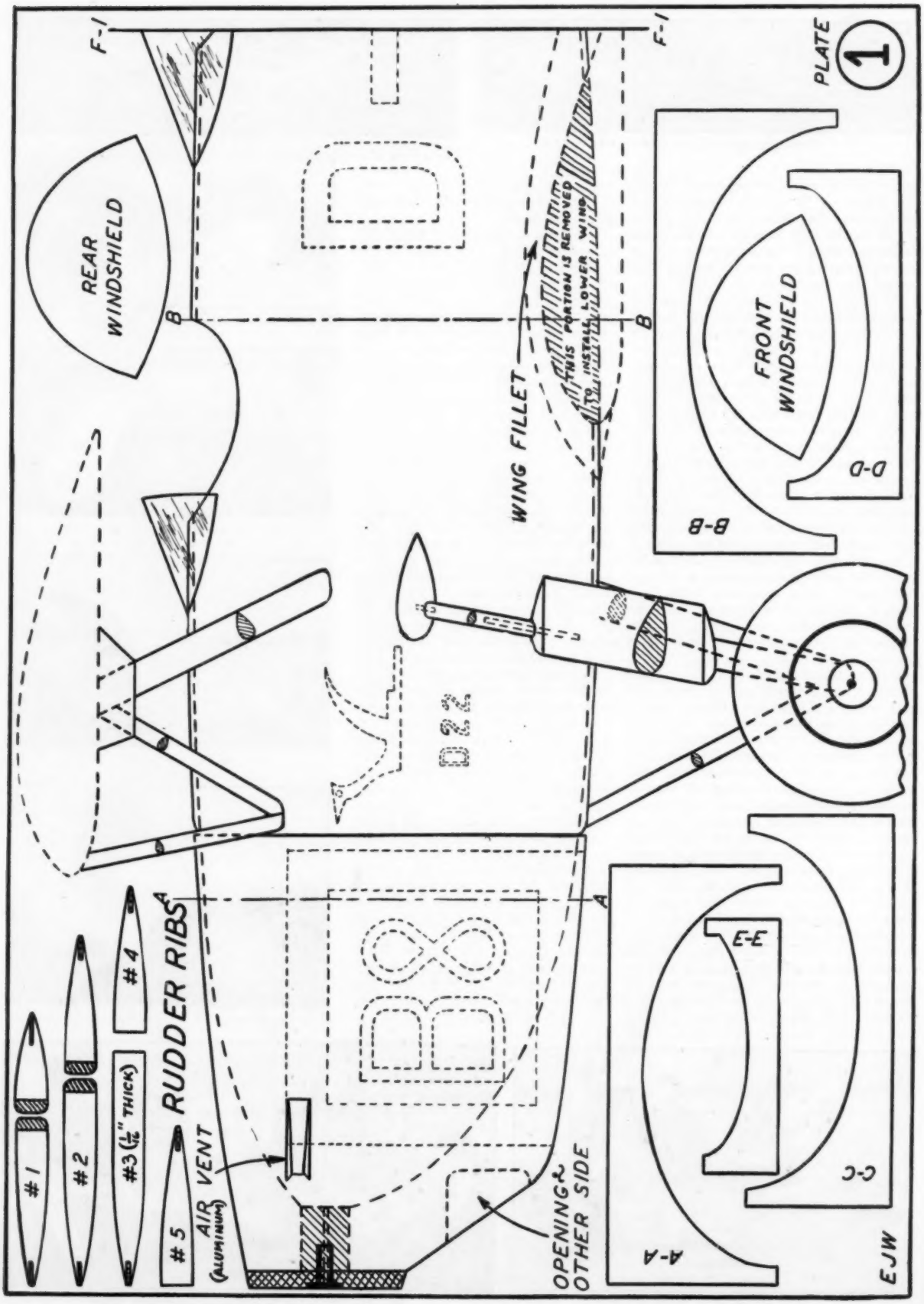
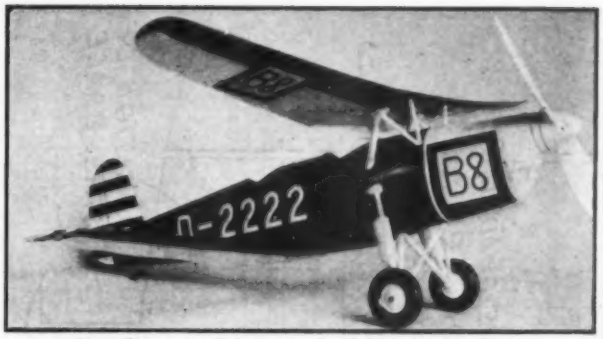


PLATE 1
F-1
F-1
REAR WINDSHIELD
FRONT WINDSHIELD
WING FILLET
THIS PORTION IS REMOVED TO INSTALL LOWER WING
B
B
B-B
D-D
A
A
E-E
C-C
A-A
EJW
#1
#2
#3 (1/16" THICK)
#4
#5 (ALUMINUM)
RUDDER RIBS
AIR VENT
OPENING OTHER SIDE

A real flight picture of the model Darmstadt D-22



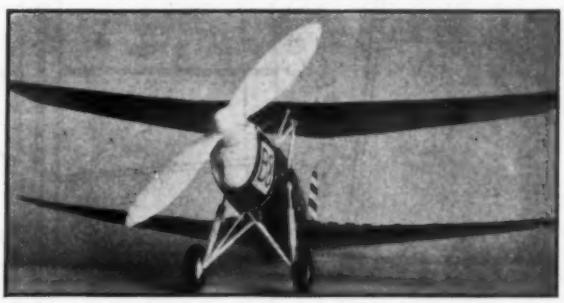
Its refinement of design and efficiency are apparent

Building the Darmstadt D-22

How You Can Build a Model of a Famous German Sport Plane Which Has Unusual Flying Qualities. Not Just Another Model

By ELBERT J. WEATHERS

THE Darmstadt D-22 is, like several modern German aircraft, strikingly different in design. This biplane is the product of The Darmstadt University Aviation Society (Academische Fliegruppe) of Darmstadt, Germany, perhaps better known for their excellent sailplane designs. It was chosen for model work because of its many novel features, which are namely, the great amount of wing stagger, the wide gap between planes, wings of extremely high aspect ratio, the omission of all outer wing struts usually found on a biplane, the long lever arm, monocoque fuselage and the amply large tail surfaces for constructing a 100% scaled model. The numerals to be painted on the model, "B8" were painted likewise on the particular large Darmstadt biplane after which the color scheme of this replica was copied, and signify the entry number assigned to this Darmstadt in a circuit air race of Europe staged in 1932. The primary purpose of the ship is a sport-trainer, and its top speed is 152 m.p.h., which speed placed it near the top in such performance figures of all the commercial planes of Europe at the time of the race. The span of each wing is 23 feet and its overall length is 21 feet. The scale to which it is reproduced is 1"=1'. The writer's original model weighs just 2¼ oz. ready to fly. All claims made for its fine flight ability will be amply proved if it is constructed with a little care to insure perfect alignment. All balsa used in construction should be of medium-hard variety unless otherwise noted.

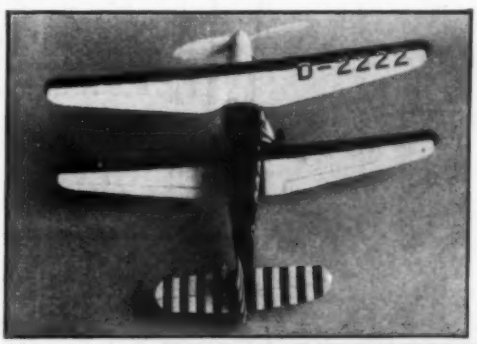


Built to scale, it is very realistic

Fuselage

This part seems to be the basic point of construction in building most models, so we lead off with this unit.

First, secure two balsa blocks, size each, 1¼"x3¼"x19", which should be fairly soft. Now cement them together at two or three points to insure temporary adhesion. Lay off the fuselage outline (side view first) and proceed to shape the block along these lines. Do the same in respect to the top view of fuselage when side shaping is completed. All operations should be well sanded. According to the templates found on Plate 1, begin to shape the exterior of the fuselage, using a knife to approach the proper cross-section at each template location. Sand it to as smooth a finish as possible. At this point, break the halves apart. It is now possible to start the removal of the balsa internally, which should be done, with a little patience, according to the dotted lines shown on the drawings. Any suitable tool may be used; a common pocket knife being employed in completing this part on the original. It need not be too smooth inside, although painting the interior with black colored dope is advised to remove the "raw" appearance. Note that a ⅜" diameter hole is made in the front end to receive the nose block. Reassemble the fuselage by cementing the two shells together, which will result in a featherweight, amply strong unit. The slight indentation made to represent the end of the engine cowl may now be made, to be followed by the rear hook block installation. Install the block itself with the end grain showing, flush with the fuselage sides. The hook is securely cemented to block first, however, and a horizontal slit is made between the hook block slot and the hole cut permanently ahead of it for rubber installation, which will allow the hook to pass through when block is inserted. Cut a dummy air vent in front, lower right side of engine cowl (see photos and drawings). The cockpits should prove easy to make, and as neither one employs combing, round off the edges for neat appearance. The section which is removed for installation of the lower wing can now be removed also. The tail skid is composed of hard balsa, size 1/16"x3/32". It is suggested that the nose block be carved or turned from wood of harder texture than balsa, preferably pine. The bearing in the plug is made from a dural rivet, with the top of the head filed or turned off. As all the piano wire fittings on the model are of No. 18 size, drill the nose plug bearing for such.



The unusual arrangement of the wings makes it very efficient and stable

Wings

The wings are four separate units, in construction. The majority of all wing ribs are of 1/32" sheet balsa, with 1/16" ribs where necessary for additional strength. The trailing edge of each wing is cut from 1/32" sheet balsa. Sheet balsa of 1/16" thickness and hard grade should be on hand for making all spars in each wing. The top right wing and lower left wing

(Continued on page 34)

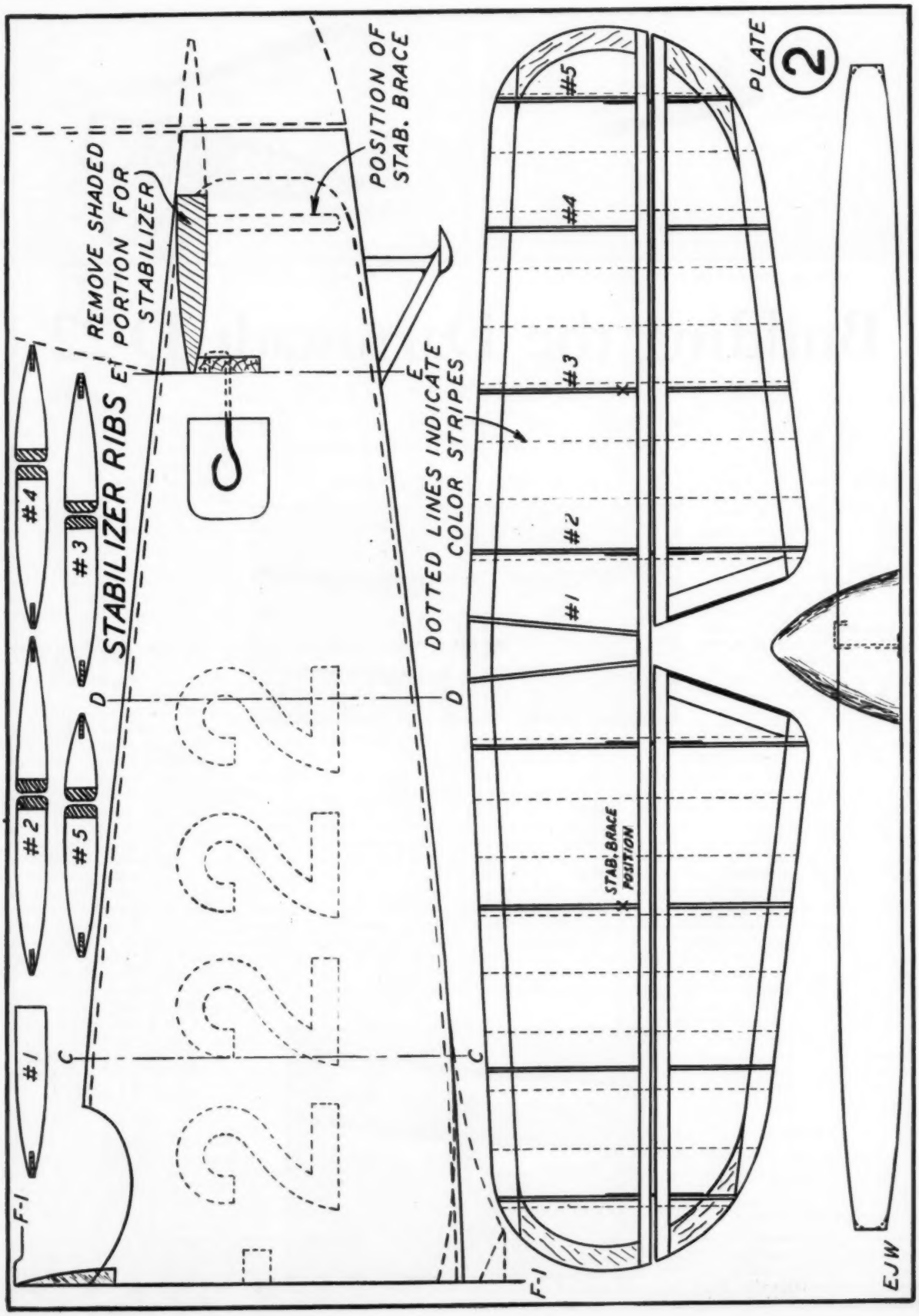


PLATE 2
REMOVE SHADED PORTION FOR STABILIZER
POSITION OF STAB. BRACE
STABILIZER RIBS
DOTTED LINES INDICATE COLOR STRIPES
#1
#2
#3
#4
#5
STAB. BRACE POSITION
F-1
C
D
E
EJW

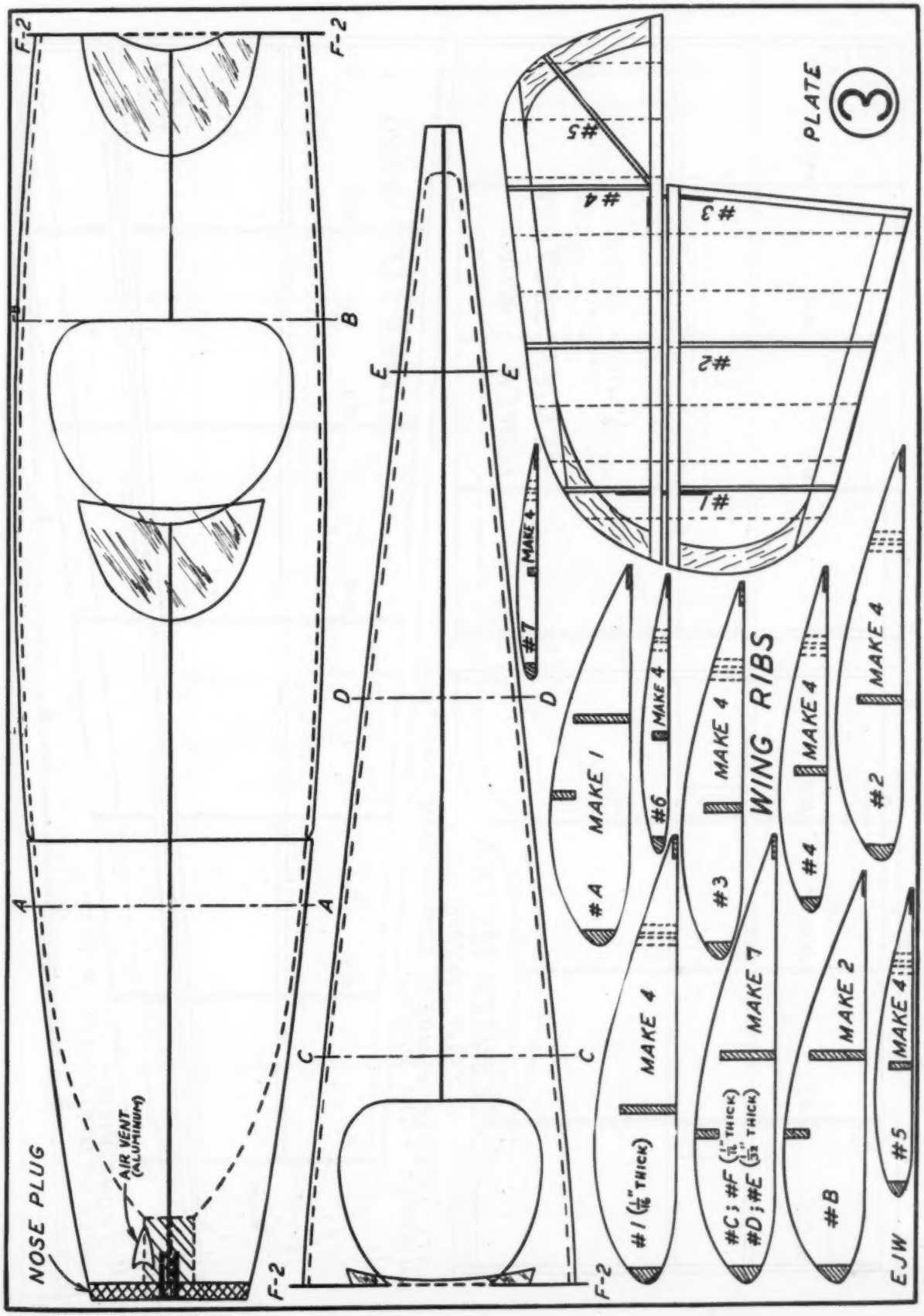
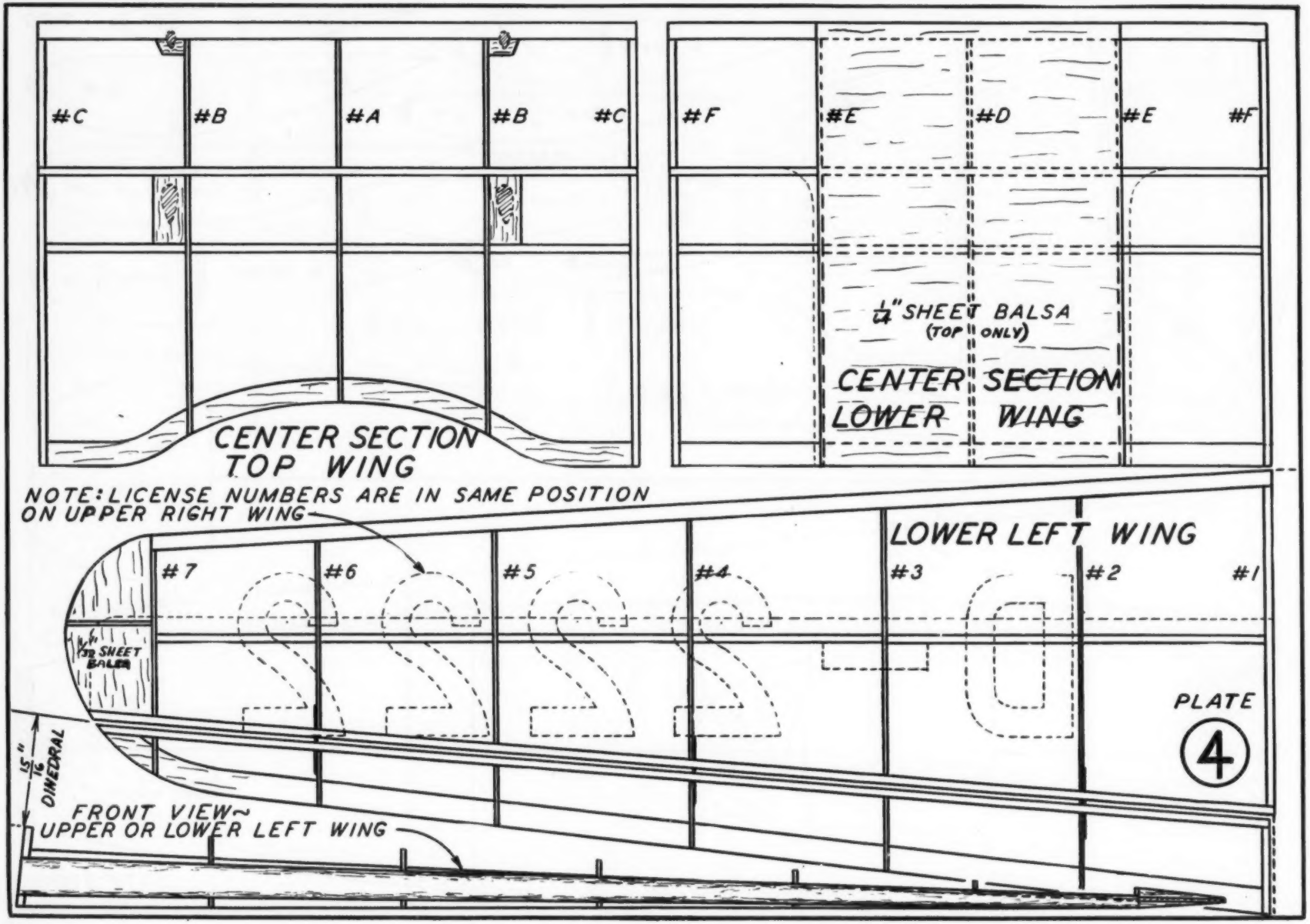
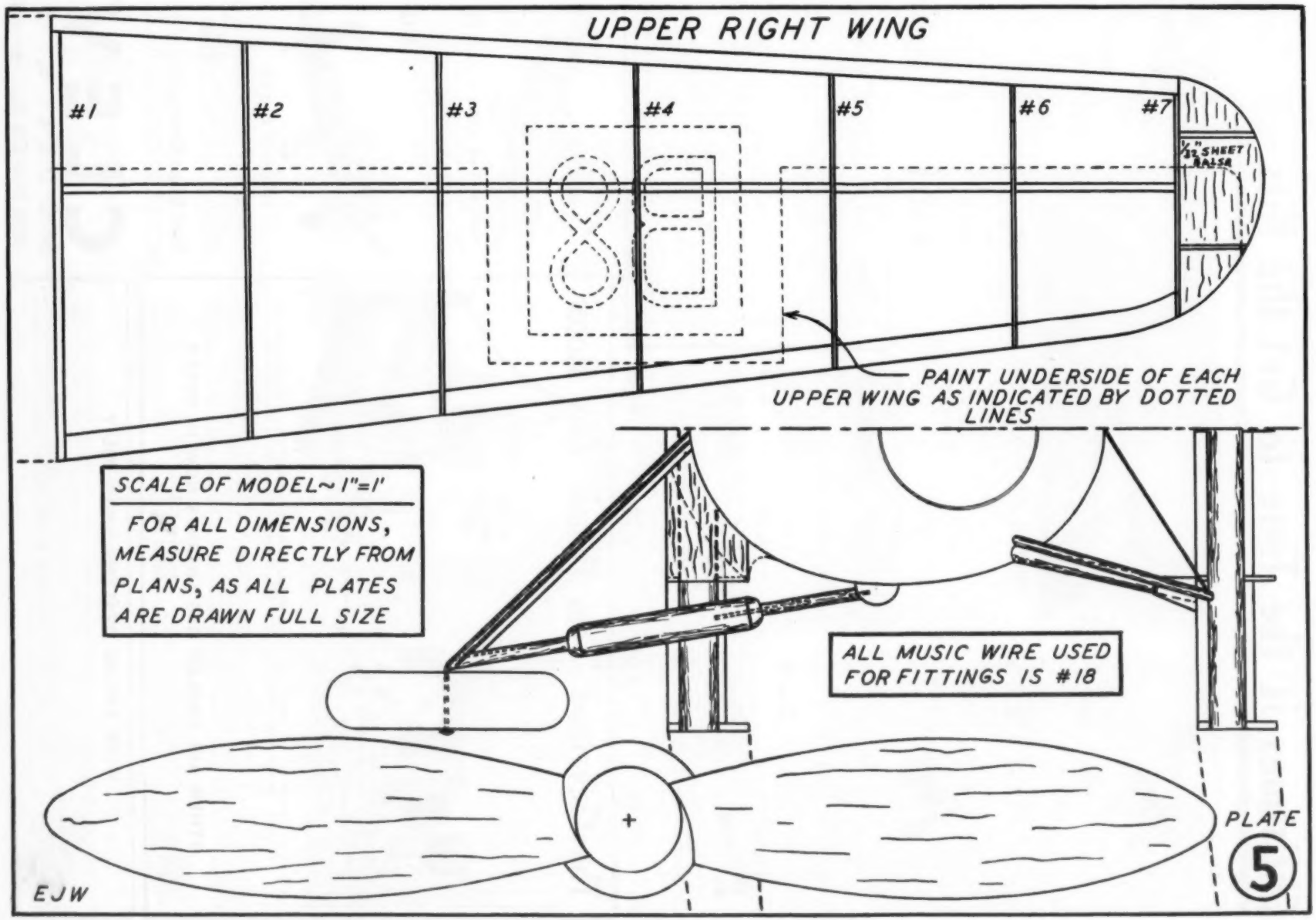


PLATE 3
F-2
F-2
B
A
A
E
E
D
D
C
C
F-2
F-2
NOSE PLUG
AIR VENT (ALUMINUM)
#5
#4
#3
#2
#1
MAKE 4
#7
MAKE 1
#A
MAKE 4
#6
MAKE 4
#3
WING RIBS
MAKE 4
#4
MAKE 4
#2
#1 (1/16" THICK)
MAKE 4
#C; #F (1/16" THICK)
#D; #E (3/32" THICK)
MAKE 7
#B
MAKE 2
#5
MAKE 4
EJW


#C
#B
#A
#B
#C
#F
#E
#D
#E
#F
1/4" SHEET BALSA (TOP ONLY)
CENTER SECTION LOWER WING
CENTER SECTION TOP WING
NOTE: LICENSE NUMBERS ARE IN SAME POSITION ON UPPER RIGHT WING
LOWER LEFT WING
#7
#6
#5
#4
#3
#2
#1
1/4" SHEET BALSA
PLATE 4
15/16" DIHEDRAL
FRONT VIEW~ UPPER OR LOWER LEFT WING


UPPER RIGHT WING
#1
#2
#3
#4
#5
#6
#7
1/32 SHEET BALSA
PAINT UNDERSIDE OF EACH UPPER WING AS INDICATED BY DOTTED LINES
SCALE OF MODEL ~ 1"=1'
FOR ALL DIMENSIONS, MEASURE DIRECTLY FROM PLANS, AS ALL PLATES ARE DRAWN FULL SIZE
ALL MUSIC WIRE USED FOR FITTINGS IS #18
PLATE 5
EJW

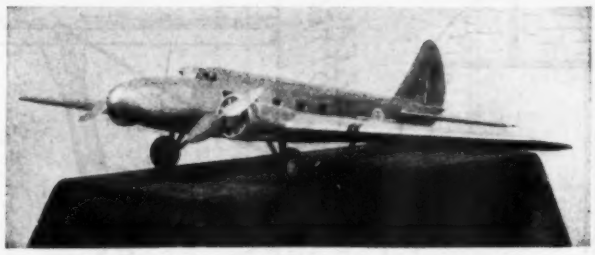
Christmas is the Time to Get the Kits

Curtiss F9C-2 "Macon Fighter"
With a Wright Whirlwind engine, these single seater ships were designed for defensive work either with dirigibles or aircraft carriers. Colored vividly, this graceful flying model presents a very striking appearance. Span 19¼". Silver, blue with red and white markings. Kit SF-22..... $2.50

Curtiss A-8 "Shrike"
Modern fast low wing attack plane that suggests a flying arsenal. Using Conqueror engine this plane carries five machine guns and a large bomb. Makes a good sized model that flies great distances. Not difficult to build. Span 38⅞". Yellow and olive drab. Kit SF-25..... $3.25

SOPWITH CAMEL
Span 20⅞", length 14¼", weight ⅛ oz. Snappy cream and brown fuselage, parts of wings and tail. Rubber cream and brown checkered. Kit SF-10..... $2.50

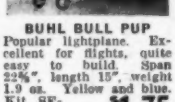
ALBATROSS D-5
Greatly improved, "filled in" fuselage, etc. Span 22", length 17¾", weight 2.3 oz. Dazzling coloring of yellow, orange, black. Zig-zag fuselage stripe. Kit SF-16..... $2.50



BOEING 247 HIGHSPEED TRANSPORT

This giant has a span of 55⅝" and a length of 38½", and is nothing less than a wizard for flights, with its two motors powerfully pulling. It is entirely gray colored and weighs 16 oz. The redesigned model has all curved wood printed-out (an enormous quantity) with data for more authentic building and appearance than heretofore, with "filled-in" fuselage, balanced controls, etc. The thoroughly engineered drawing of four large panels (17"x44"), each contains accurate modeling information and over 16 oz. of liquids, dope, cement, etc., contained within each one of the new giant Kits. Kit. SF-35, postfree..... $8.50

NIEUPORT 28
Called most beautiful World War model and it certainly is. A beauty for flights, too. Span 20¾", length 16¼", weight 2.1 oz. All silver. Kit SF-30..... $2.50



BUHL BULL PUP
Popular lightplane. Excellent for flights, quite easy to build. Span 22⅝", length 15", weight 1.9 oz. Yellow and blue. Kit. SF-38..... $1.75

HALL RACER
Speed flights. Span 19⅛", length 13⅜", weight 2.8 oz. Red with beautiful black scalloping—nothing else ever like it. Kit SF-31..... $2.75

POLISH P-6 FIGHTER
A real beauty—with "filled-in" fuselage, etc. Span 25⅛", length 17⅛", weight 2.5 oz. All silver. Kit SF-6..... $2.95

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SF- 3	De Havilland-4	31 7/8	3.50
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SF-10	Sopwith Camel	20 7/8	2.50
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SF-13	Spad 13	19	2.65
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SF-16	Albatross Fighter	22	2.50
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SF-25	Curtiss A-8	32 7/8	3.25
SF-26	Heath Parasol	23 1/8	.98
SF-27	Doolittle's Goo-Bee	16 5/8	2.50
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SF-29	Boeing F4B-3 Fighter	22 1/2	2.85
SF-30	Nieuport 28 Fighter	20 3/4	2.50
SF-31	Hall Racer	19 1/2	2.75
SF-32	Boeing 95 Mail	33 1/4	2.50
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More affectionately known as the "Jenny," this OX-5 powered war time trainer many of our famous old timers learned to fly in. Used extensively in movie scenes until several years ago. Beautiful, capable of great flight, interesting to build with its mess of wires, etc. Span 32⅝", colored yellow with brown trim. Kit SF-4 **$3.25**

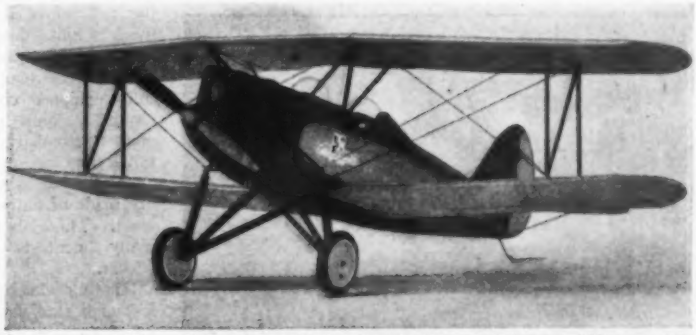
Capt. Page's Curtiss Racer

This racer representing the U. S. Navy was remodelled from a Curtiss Hawk (Curtiss Conqueror engine). Having a thin fuselage and wheel shoes it has an attractive "racy" appearance. This beautiful model has excellent flight characteristics. Span 23⅝". Silver with colored insignia. Kit SF-44..... **$2.65**

They're All Raving About This

RYAN SPORTSTER ST

This beautiful little two place job is well known to model-builders everywhere and our model looks as pretty as does the prototype. Span of course 20", suggested coloring, all silver, like the prototype. Model stable and fast. Kit R-58 complete (except liquids), postfree, only..... **50c**



Compare this with the original $5.50 model; you'll see it's

THE BUY OF A LIFETIME!

GREAT LAKES SPORT TRAINER 2T1-E—This famous design was formerly the flag ship of the C-D fleet—the ship that changed almost every known standard in the model aircraft industry. The kit originally sold for $5.50, and being such an excellent flyer, with so many requests that we bring back this beautiful number, we have done so; and to show the extra quality in the present day C-D designs, this number is now being sold for 50c and is legitimately priced. The model is almost identical with the older design, with but few minor exceptions, and the changes are really improvements, so that you can see that we are selling better models in this low price, light, flying "R-X"-perimental Range at 50c today than we did a few years ago at $5.50—at 1/11 the price! And the old kit didn't even include printed out wood, yet it was a superb bargain at the time (from '29 to '32). This will show our present ¾" scale model value (SF-1 Great Lakes Sport Trainer, Model 2T1-F) even at $2.65 is several times better in general design and a far better bargain than what we sold originally at $5.50. This fine flying model Kit, another experimental "REP" Kit (yes, it's ¾" scale, too—do you want more?), suggested coloring, orange and black. Kit No. R-57 (Formerly R-X5003) complete (except liquids) only..... **50c**

Don't Fail to Build This Keen

CURTISS HAWK P6-E FIGHTER

Hard to tell this actual 20" model photo from our ¾" model. Full of typical C-D authentic features and details. Speedy flights. Kit R-21, complete (except liquids), postfree, only..... **50c**

HAWKER LOW WING MERLIN-POWERED FIGHTER

Landing gear may be fully retracted as on the prototype, coloring suggested all silver; insignia supplied. A "peach" for flights. Kit R-59 complete (except liquids) post free only..... **50c**

An Amphibion Never Yet Equalled.

CLEVELAND AMPHIBION

Will take off water like the real thing. Span 28". Twin motored. Long steady flights. Kit R-X5001, complete (except liquids) only..... **60c**

EUROPEAN DEALERS Communicate with our European Factory Representative: H. Vlien, Nybrokajen 7, Stockholm C, Sweden. Attractive territories still available. Regular full factory discounts allowed. European factory Stock Depot in Freeport will give you quickest deliveries, 24 hour service, at no extra cost.

CLEVELAND MODEL & SUPPLY CO., INC.
★ Cleveland, Ohio, U. S. A.

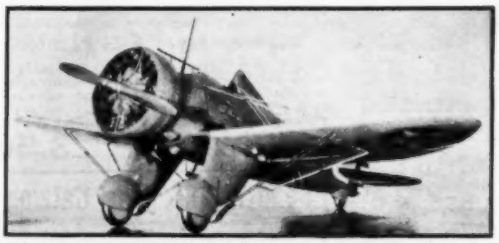
Immediate delivery. Add 15c for postage. Canada, Mexico, British Isles customers—add 20c per order. "LIGHTNING SERVICE."

The Fokker D-21 single seat pursuit, by Wm. Drake

AIR WAYS
HERE AND THERE

What Readers Are Doing to Increase Their Knowledge of Aviation in All Parts of the World. Send Pictures and Details of Your Experiments

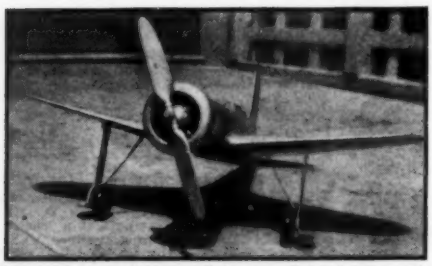
Air Ways Club News



Pict. No. 1. One of the finest models shown in Air Ways. A Boeing P-26A by George Meese

THIS month Mr. William C. Drake of 3 Pine Street, Malden, Mass., has pictured one of the latest pursuit ships turned out by Anthony Fokker, the Fokker D-21. The speed is said to be nearly 250 miles per hour. As usual, the drawing by Mr. Drake is of high quality and his contribution is appreciated.

The finest entry received by the Air Ways department this month has been made by George Meese of 323 Karl Court, Dover, Ohio. It is picture No. 1, which shows his detail scale Boeing P-26A. The workmanship on this little job is truly remarkable. Not only are all the individual parts included, but each part in itself shows refinement of detail. It required 264 hours to complete it and includes 1577 individual parts. All the controls are movable from the cockpit, from which the flaps also may be adjusted. Even the tail wheel housing and the cockpit door operate. The little job boasts of a complete radio antenna and a fully equipped cockpit. The motor is built up of 503 pieces. Bomb racks are detailed and are made up of 74 pieces. The wire braces are made of flat wire of two sizes. This job should win many contests for Mr. Meese.



Pict. No. 2. A neat flying model of Howard Hughes racer by Dick Twohy

Another excellent, though less elaborate, model, due to its clean lines, is shown in picture No. 2. It is Dick Twohy's Hughes racer. Twohy is located at 628 Petroleum Securities Building, Los Angeles, Calif. The model is well detailed and fully covered with 1/64" balsa veneer. There is an adjustment on the rear motor hook which causes the landing gear to retract after the model has left the ground. Just before the end of the flight the landing gear is released, ready for the landing.

Twohy tells us that he has had a little misfortune. For four months he has been lying in bed due to an automobile accident in which he broke his back. In order that the time might pass quickly he resorted to model building. On behalf of the Air Ways Club we wish Twohy a quick recovery.

Picture No. 3 shows an unusual model built by C. Wrigley of 7 Alexander Drive, Liverpool 17, England. The picture shows a model of Campbell Black's D. H. Comet. The unusual thing about it is that it is built up of cardboard, wood and pins. Though a none-flying model, it presents a striking appearance.

Pict. No. 7. An action "shot" of the Mississippi Valley Contest in full swing. Gas jobs played a prominent part

CLUB NEWS
Mississippi Valley Meet

Due to the good weather model builders all over the country have been holding many contests. We have news from Mr. H. T. Sommers, Assistant Director of the Stix, Baer and Fuller Model Airplane Club of St. Louis, Missouri, telling us of the Mississippi Valley Model Airplane Contest which was held recently. This contest is one of the big contests of the year, and Mr. Sommers has sent some very interesting pictures showing some of the activities.

Picture No. 4 shows an unusual looking gas model designed by H. Lamont of St. Louis. Raising the motor on the wing as shown is one way of eliminating a good part of the landing gear.

Picture No. 5 shows R. Podolsky's first prize winner in the gas event.

Picture No. 6 shows Mr. and Mrs. Victor Cunningham. It is evident from this that model building is not confined to juniors. More and more older people are taking this sport up as a hobby. This is probably due to the fact that as the art of model building advances it is realized that much serious thought is involved in designing and building one of the little ships.

Picture No. 7 shows a general view of the contest as fliers were busy preparing their models for the various flying events.

Picture No. 8 shows the impressive array of prizes

Pict. No. 6. Mr. and Mrs. V. Cunningham were contestants at St. Louis

Pict. No. 5. R. Podolsky and his winning gas model

Pict. No. 9. Ken Carpenter, "All American Jr. Aviator"

which were presented to winners. Who could be without a prize in such a contest?

Mr. Sommers' account of the contest is as follows:

The 1936 Mississippi Valley Model Airplane Meet

Competition on a par with the 1935 and 1936 National and International Model Airplane Contests was the prevailing condition in the sixth Mississippi Valley Model Airplane Meet held August 21 and 22, 1936. The Meet was originated and sponsored by Stix, Baer and Fuller, was co-sponsored by Parks Air College and the Young Men's Division of the Chamber of Commerce.

The Meet, regional in scope, brought boys from all parts of the Middle-west. Among the cities which sent large delegations were Sheboygan, Wis.; Little Rock, Ark.; Chicago, Ill.; Burlington, Ia.; Louisville, Kentucky; and Jefferson City, Mo.

There were twelve events on the program. The indoor events were held first on August 21 and the outdoor events the following day at the Parks Airport, immediately across the Mississippi River opposite St. Louis. Two free six-day trips to the Texas Centennial Exposition in Dallas and 120 prizes, which included trophies, cups, gold, silver and bronze medals and certificates were donated by Stix, Baer and Fuller and other St. Louis business organizations.

Lennox Murphy of St. Louis, 14 year old member of the local club, and Roy Marquardt, Burlington, Iowa, each won one of the free trips to the Dallas Exposition and Albert W. Courtial, Jr., received the big three year trophy awarded by Stix, Baer and Fuller.

Flying began promptly at 10:00 o'clock and as the indoor events progressed many excellent flights were made, among them being Ralph Kummer's indoor stick which remained in the air for 21 minutes and 18 seconds. Sidney Axelrod of Chicago had designed and built an adjustable pitch propeller for indoor ships and the way his ship performed in a flight of 19 minutes and 30 seconds gave him second place and proved he had uncovered a new wrinkle in this sport of indoor model building. In the open class competition, Carl Goldberg of Chicago set his ship up for the record duration flight of the day—22 minutes flat. It was an effort to improve his own world record.

The indoor fuselage event was won by Albert Courtial of St. Louis with a flight of 12 minutes 15 seconds. Although this was comparatively poor time for Courtial's ship, under the conditions it was not so bad.

In late afternoon the hot August sun had full opportunity to beam unmercifully on the roof of the building and the temperature went up to 115 degrees—at least that is what it felt like. The contest closed at 6:00 o'clock.

On August 22, the second and last day of the Meet, the outdoor entrants went to Parks Airport. Special chartered busses carried hundreds of spectators and contestants to the airport bright and early in the morning. Others came by auto and some by "thumb."

The entire airport and facilities was turned over to the model airplane flyers and flying began about 9:30 a.m., continuing steadily throughout the day. A strong hot wind blew from the west causing many models to smash and many more to fly to near record Several world's records would have been established had the rules of the Meet permitted judges and timers to leave the airport. However, this rule was rigidly enforced and for very commendable reasons. The airport had only one outlet and models were constantly flying over country where there were no roads and then some models would sail directly over highways where timers could keep them in sight for long periods. Another reason offered was the matter of taking officials of flight groups away from their posts for great lengths of time which deprived other entrants from getting all their official flights.

By the noon hour a crowd of several thousand spectators was on the field to enjoy the antics of the little ships in the strong wind. Wallace Simmers, of Chicago, after a little difficulty got his Senior Fuselage model off for the winning flight of the day in that division with a trip into the blue cloudless sky for 13 minutes 6 sec-

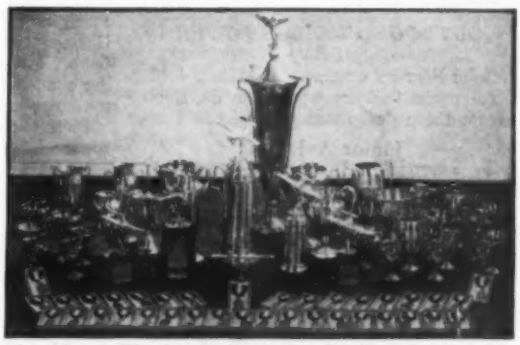
(Continued on page 28)

Pict. No. 11. Henry Hohner and Mary Walker weigh in a glider

Pict. No. 13. A view of the Price Hill Model Airplane Club's workshop and club room, one of the best equipped in the country

Pict. No. 3. A scale model of the D. H. Comet, made of cardboard, wood and pins, by C. Wrigley

Pict. No. 4. H. Lamont and his gas job of unusual design, with a "stunted" landing gear



Pict. No. 8. The impressive array of prizes given at the Mississippi Valley Contest

Pict. No. 10. Ed Deemes, winner in original design

Pict. No. 12. Members of the Central Model Aero Club and the compressed air model with which they have been experimenting at Stevens Point, Wis.

Airways—Here and There

(Continued from page 27)

onds. Roy Marquardt of Burlington, Iowa won first place in the Senior Stick type with a flight of 6 minutes and 13 seconds, but Bob Donahue of St. Louis came very close second with a fine flight of 5 minutes and 48 seconds.

Saturday evening all contestants and officials were the guests of Stix, Baer and Fuller at a banquet held in the spacious dining hall of the Parks Air College, after which prizes were awarded.

Results of the Contest

INDOOR STICK (JUNIOR)
1. Lennox Murphy 7:25

OUTDOOR STICK TYPE (SENIOR)
1. Roy Marquardt (Ia.) 6:13

OUTDOOR STICK TYPE OPEN
1. Mrs. Martha Dodd 2:50

INDOOR STICK (SENIOR)
1. Ralph Kummer 21:18

INDOOR FUSELAGE (SENIOR)
1. Albert Courtial, Jr. 12:15

OUTDOOR FUSELAGE TYPE (SENIOR)
1. Wallace Simmers (Chi., Ill.) 13:06

AMATEUR SWEEPSTAKES
1. Frank Burgert 3:37

INDOOR STICK OPEN
1. Carl Goldberg (Ill.) 20:34

GASOLINE EVENT
1. Ray Podolsky 10:16

OUTDOOR FUSELAGE TYPE (JR.)
1. Billy Riordan 4:16

OUTDOOR STICK TYPE (JUNIOR)
1. Franklin Essner 2:085

OUTDOOR FUSELAGE TYPE (OPEN)
1. John Foerster 4:18

All model builders were from St. Louis except those designated otherwise.

Junior Aviators

The National Junior Air Races were held recently at Buffalo, New York. Any member of the Scripps-Howard Junior Aviators was eligible to compete and model fliers from all over the country assembled to put on a remarkable show. The contest was held at the Buffalo Airport on August 30 to September 2, and 38 junior fliers won prizes and cash valued to $1,500.

Picture No. 9 shows Ken Carpenter of Akron, Ohio, who was voted "All American Junior Aviator" at the National Races.

Chester Lanzo of Cleveland, Ohio, was awarded the Major Al Williams Championship Trophy, having broken a world's record. Charles McCowen of Memphis, Tennessee, was stick model winner in the Scripps-Howard Transcontinental Air Derby.

Picture No. 10 shows Ed. Deemes, of Cleveland, Ohio, who won the original design contest. He is holding the ship which gave him the first prize. It is most unusual to say the least and we can imagine Deemes lying awake many nights to visualize a model of this type. Some might classify it as an excellent specimen of futurist art in aviation.

Metropolitan Model League

Recently the Metropolitan Model League of 421 Seventh Avenue, New York City, held its outdoor contest at Van Courtlandt Park. Picture No. 11 shows Henry Hohner of Newark, New Jersey, winner of the glider event, and Mary Walker, who was timer and recorder of the meet. From the picture we judge that they are very well pleased with the reading of the scale on which the glider is suspended, or possibly the photographer was cracking a joke at the time the picture was taken.

Central Model Aero Club

The Central Model Aero Club, with headquarters at 433 Center Street, Stevens Point, Wisconsin, is an extremely progressive and active group. Picture No. 12 shows a number of its members gathered about one of their latest creations, a compressed air model built from Howard McEntee's plans that were printed some time ago in MODEL AIRPLANE NEWS. This group flies regularly every Sunday afternoon on the farm of Charles Kohls, one of its members.

The secretary of the club tells us that the only mishap which occurred during the flights of the model came about when the model glided into a cow, which resulted in a broken prop. It is not stated whether the prop belonged to the cow or the model. Mr. Kohls, who supplies the cow and the field, is fourth from the right in the group. We are told that the lack of wearing apparel in some cases is due to discomfort experienced while pumping pressure into the air tank under the beating sun.

Price Hill Model Airplane Club

One of the most active and progressive model clubs in the country today is the Price Hill Model Airplane Club of 4309 Glenway Avenue, Price Hill, Cincinnati, Ohio. Mr. Richard Kispert, a member of the club, has been kind enough to send us a picture and information concerning it.

Picture No. 13 shows a view of the club room with a number of the members busily engaged.

The average daily attendance at the club room is about 75.

American Legion Contest

From Mr. Arthur A. Boehle of Indianapolis, Indiana, R. R. 1, Box 435, we have news of the American Legion Contest held August 29th and 30th at Indianapolis. Mr. Boehle says that about 10,000 people turned out to see the flying. It was a clear day but a high wind made it difficult at times for the model fliers.

Kenneth Ernst of Indianapolis made a flight of 54 min., 43 sec., with a gas job, running it down after about twenty-six miles. There were twenty-six boys down from Chicago alone. Detroit was also represented, as was Findlay, Ohio, and Atlanta, Georgia. There were 140 contestants. Mr. Boehle was chief assistant at the contest.

Canadian National Model Championships

The Canadian National Model Championships were held in Toronto on Aug. 31 to Sept. 2. Many builders from the United States attended. The results of the contest are as follows:

Outdoor Results

OUTDOOR STICK MODELS

15 and Under

*1. Leonard Fisher, Winnipeg Man. 4:12 3/5

16 and Over

1. Bill Doe, Vancouver, B.C. 6:27

Indoor Results

SEMI-SCALE (JUNIOR)

	Pts.	Time
*1. Clarence Dunn, Hamilton, Ont.	218	2:09

WAKEFIELD (OPEN)

Average of Three Flights

*1. Paul Verdier, Ottawa, Ont. 4:53

(SENIOR)

*1. Paul Verdier, Ottawa, Ont.	388	4:58

GAS MODELS (OPEN)

*1. Bruno Marchi, Boston, Mass. 7:45

(OPEN—ADULT)

1. Owen Corfield, Port Dalhousie, Ont.	229	2:23

FUSELAGE (OPEN)

*1. James J. Haffey, Toronto, Ont. 9:59

STICK (JUNIOR)

*1. Bert Norman, Vancouver, B.C. 10:15

(OPEN)

*1. Joseph P. Matulis, Chicago, Ill. 12:29

Junior Champion—Clarence Dunn, Hamilton, Ont.

Senior Champion—Paul Verdier, Ottawa, Ont.

Adult Champion—Bruno Marchi, Boston, Mass.

*(Astericks indicate new Canadian records)

Cups, trophies, plaques, medals, and kits were awarded to winners of places.

This contest was held under the auspices of the New York State Fair and was sponsored by the Exchange Club and the Syracuse Model Airplane Club. In all, there were one hundred fifteen entries, and it was by far the largest contest ever held in Central New York. The weather was just about perfect for model flying as may be judged by the very high times.

Springfield, Illinois

We have word from J. W. Davenport of 616 Woodland Avenue, Springfield, Ill., that he intends to start a model club in Springfield. Model builders in that vicinity should get in touch with Mr. Davenport if they feel that they would like to join the club.

New York State Contest

Another important contest which took place on Sept. 9 was the New York State Fair Outdoor Model Airplane Championship. Jean S. Chadwick of 110 Merriman Ave., Syracuse, New York, president of the Syracuse Model Airplane Club, sends us the results of the contest, which are as follows:

(Continued on page 48)

On Frontiers of Aviation

(Continued from page 11)

Rae had the fastest Menasco-powered plane at the races and Kling with his Kieth-Rider might have been a close second had the plane not crashed during a landing early in the races.

Marion McKeen did some renovating to his Miss Los Angeles and more than made expenses. McKeen flew some good races and hugged the pylons though at times he had engine trouble. His plane was always the fastest on the take-off, but it just didn't have speed enough to hold its lead throughout the race. The prop on McKeen's ship was of comparatively low pitch which accounts for the fast take-off. Had he had a controllable pitch prop he could have increased the pitch after the take-off and would have done fifty per cent better. If all the other planes had controllable pitch props they too would have done much better than they did. The only racing plane of the smaller class that had a controllable prop was the Frenchman's Caudron-Renault (which is described later in this article). Before each race, air was pumped into the spinner which lessened the pitch of the blades. When the plane took off in a race, a valve slowly let air out of the spinner and the pitch of the blades automatically increased. This is known as the Ratier type of controllable pitch propeller. The pitch on Crosby's new racer was probably the highest of the group and gave his ship very slow take-off qualities which is without doubt one of the reasons he did not do better in the races.

It was a wonderful little airplane of the most modern all-metal construction. Harry Crosby, pilot, almost has to lie down in the cockpit to fly the plane. One of the new super-Buccaneer Menascos with 290 h.p. at take-off was built into the plane. Construction of the plane was started in June of this year which allowed little time for completion. However one week before the races started, Harry took the plane up for its first test flight only to make a forced landing a few minutes later when the engine overheated. The plane was not damaged, and after correcting the cooling trouble the plane was again test hopped. Again the plane was almost smashed when it slid down the runway sideways while landing. Once more the little speedster was overhauled and again Harry Crosby took her up to qualify for the Thompson Trophy Race which he did at 222 m.p.h. He could not get his landing gear all the way down after qualifying and had to land with it half raised. For the third time he miraculously landed without a crack-up. By this time all the major bugs were eliminated from the ship, and it did fairly well in the last two races of the meet. Because of the scarcity of time many minor details of the racer were not completed as planned. The fairing that covered the landing gear when retracted was not put on and only a temporary windshield was used. This slowed the airplane considerably on the pylon turns and with the high pitch propeller it took too long to increase its speed again before it reached the next pylon. However, Crosby now has plenty of time to attend to these minor details, and there is no reason why he cannot obtain speeds up to 270 miles per hour out of it with ease. Crosby is a real sportsman and flew two wonderful races for a newcomer at the game. His only other racing experience is said to be when he flew the old famous Laird "Solution". He has gained much flying experience down in South America also.

His ship was thoroughly wind-tunnel tested before it was built. The wing spread is fourteen feet overall and is equipped with split trailing edge flaps. Forty gallons of gas may be carried which is more than enough for the 150 mile Thompson Trophy Race. Total weight is about 1,500 pounds. In spite of the high weight and low wing area it had one of the best landing characteristics of any racing plane present. This may best be explained by the fact that it was equipped with brakes and had a very wide tread and long fuselage. It set very low to the ground which kept it from tipping over. One interesting feature was that the oil was carried in the leading edge of the low wing. Future performances of this plane should be very promising.

Lee Miles' "Miss Tulsa" was present but engine trouble stopped him from getting any sensational speeds out of it. As usual Benny Howard's "Pete" and "Mike" participated with Joe Jacobsen at the controls. All the small racers were Menasco-powered except the Frenchman's and "Pete".

Michel Detroyat, the French participant, walked away with the honors. His plane was expected to be fast, but it turned out to be much faster than anyone had expected. Michel never did "open her up" but still it was the fastest plane ever at the races. In the second lap of the Thompson it averaged 301 m.p.h. with a total for the 15 laps of 266 m.p.h.!—a new Thompson record. The engine used in the plane, a Caudron-Renault which once held the landplane speed record, was a six-cylinder, air-cooled in-line engine said to have a displacement of only 488 cubic inches which made it eligible for the Greve as well as the Thompson Race. Top speed of the racer, which is much larger than the average American Menasco-powered racer, is claimed to be about 325 m.p.h. Details of the plane have been kept somewhat of a secret, and it is not known just what the power output of its small engine is. However it is much more than that produced by our Menasco engines and is in the neighborhood of 350 hp. However, following the completion of the Coupe Deutche de la Meurthe and Coupe Helene Boucher races in France, MODEL AIRPLANE NEWS next month will give you complete details of Detroyat's Caudron and of those used in the above mentioned races. A new 1936 version of Detroyat's Caudron has just been completed and is powered by a V-12 engine. It was expected that this plane would be completed in time for the Deutche de la Meurthe Race.

Earl Ortman was present with a new paint job of red and gold, the colors of the Gilmore Oil Company which he represented, on his big Wasp-powered Kieth-Rider. The plane was only entered in the Thompson Trophy Race. It qualified for the race at 260 m.p.h. and averaged 247 m.p.h. in the Thompson to win second place. The plane is all-metal and was first test hopped by Jim Granger who unfortunately was killed in it. The crash did not damage the plane very badly, and it was rebuilt for Earl Ortman who later broke the San Francisco-Los Angeles and Canada-Mexico speed records. It was entered in the Bendix Race last year but an oil leak forced it out of the speed dash.

Jacqueline Cockran's huge Q.E.D. did fairly well in the Thompson Race. It was not built for that sort of race but it showed plenty of speed around the pylons. However, its Hornet engine refused to function properly towards the end of the race.

Gerd Achgelis, the German stunt flier, performed each of the four days of the meet in a Focke-Wulf high-wing monoplane powered by an Argus engine. The Roumanian stunter, Capt. Papana, flew a small Bucker biplane with swept-back wings. Detroyat of France stunted in his Mauraine-Saulnier which he had at the races last year.

The Bendix Race was a disappointment in that no special built racing planes completed the race. However Louise Thaden and her co-pilot Blanche Noyes showed surprisingly fast speed in their Beechcraft to win the race after a flight of 14 hours and 54 minutes across the continent.

Scoops Scooped While Snooping

It has been reported that the ten flying boats being built by the Boeing Airplane Company are of the Martin Clipper design. Northrop, North American, and Seversky

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF MARCH 3, 1933

Of MODEL AIRPLANE NEWS published monthly at Mount Morris, Ill., for October 1st, 1936, State of New York, County of New York.

Before me, a Notary Public in and for the State and County aforesaid, personally appeared George C. Johnson, who, having been duly sworn according to law, deposes and says that he is the Publisher of MODEL AIRPLANE NEWS and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of March 3, 1933, embodied in Section 411, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher, George C. Johnson, 551 Fifth Avenue, New York, N.Y., Editor, Charles H. Grant, 551 Fifth Avenue, New York, N.Y., Managing Editor, George C. Johnson, 551 Fifth Avenue, New York, N.Y., Business Manager, George C. Johnson, 551 Fifth Avenue, New York, N.Y.

2. That the owner is: Jay Publishing Corp., 551 Fifth Avenue, New York, N.Y. George C. Johnson, 551 Fifth Avenue, New York, N.Y.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of the total amount of bonds, mortgages, or other securities are: None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

George C. Johnson, publisher. Sworn to and subscribed before me this 24th day of September, 1936. Peggy Horowitz. (My commission expires January 15, 1937.)

OVERNIGHT A NATION-WIDE SENSATION!

THE NEW

RED ZEPHYR

IS THE ONLY LOW-PRICED MODEL WITH ALL THESE **Vital Features:**

Every 1937 Improvement!

- **Precision Built!** Accurate, detailed, full-size drawings guarantee you a perfect model.
- **Quality Features!** Simple but highly efficient aerodynamic design.
- **Performance!** Takes off from the ground unassisted in about 25 feet and climbs beautifully.
- **Economy!** Inexpensive in initial cost and in upkeep.
- **Special Features!** Full shock-absorbing landing gear is equipped with new type brackets.
- **Beauty!** It is an exceptionally good looking ship—colored white with red and black flares on wing and tail surfaces.

6 ft. Wingspan • 56 in. Long • Weight (with motor) 3½ lbs.

Scientific makes history in the gas model field with the Red Zephyr.

This new Scientific Gas Model has many distinctive features. The full shock absorbing landing gear is equipped with new type brackets. The aero-dynamic design is simple but highly effective and the model is easy to construct.

Other features include: Vibration absorbing motor mount, extra strong nose and low wing loading. Both the initial cost and upkeep are economical. The model is beautifully colored: White with red and black trim. It is an exceptionally good looking ship, and is

GUARANTEED TO FLY!!

HERE'S WHAT THE RED ZEPHYR KIT INCLUDES:

1 pair pneumatic rubber wheels; complete printed out wood including ribs, bulkheads, wing tips, etc.; all strip wood of finest quality accurately cut to size; bamboo paper for covering; rubber; hard wood propeller blank; complete set of hardware including nuts, bolts, heavy landing gear wire; new type landing gear brackets, battery wire, washers, etc.; 1/32" 3-ply birch veneer for covering nose of model; strip spruce for parts needing added strength; large can of gas model cement; streamline tail wheel; complete assortment of numerals, lettering and "Red Zephyr" insignia; 2 giant full size detailed plans giving every bit of information needed for building and flying the "Red Zephyr."

$5.95 POST PAID or at Your Dealer

STILL THE NATION'S BIGGEST KIT SENSATION!

Miss America

GAS MODEL DE LUXE

7 ft. Wingspan • Wt. 4½ lbs. • 22 min. on 1 oz. • 18 to 1 Glide

- The shock-proof landing gear, landing gear brackets, balance tabs on rudder and stabilizer for correct adjustments of flights, and new type battery box are only a few of the many features in this striking gas model.
- The model is beautifully colored, wings being doped a brilliant red and fuselage blue with black and white trim. It is built for either Brown or Cyclone engines (or any reliable motor now on the market).

● Here's What You Get:—

1 Pr. Pneumatic Rubber wheels, two giant full-size detailed plans streamline tail wheel; wood cement, bamboo paper cement, red, blue and black, dopes; printed-out ribs, bulkheads, wing tips, etc.; special covering material; celluloid; rubber; hard wood propeller blank; complete hardware; 1/32" 3-ply birch for covering front of model; strip spruce; complete insignia, etc.

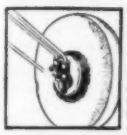
Complete Kit (Less Motor) **$9.50** POSTPAID or at Your Dealer

Higher cost of raw material and manufacture, and additional expense of the extra quality materials now being used in the "Miss America" kit have forced a raise in price for this kit. Reading the list of contents will give you some idea of the kit's worth, but only after you've actually seen the kit, and examined its parts, will you realize what a real value the "Miss America" is at $9.50!

SCIENTIFIC MODEL AIRPLANE CO., 218-220 M-12 MARKET ST., NEWARK, N. J.

In England: H. & S. Norman, 46 Derby Rd., Kirkhams, Prestwich, Lancs.
In Australia: Swift Model Aircraft, 156 Adelaide St., Brisbane, Queensland.
In South Africa: Stratosphere Model Aircraft Supplies, P. O. Box 3248, Johannesburg.
In France: E. Kruger & Co., 9 Rue St. Sebastien, Paris.

WORLD'S LARGEST ASSORTMENT of HIGH QUALITY GAS MODEL SUPPLIES at LOWEST PRICES



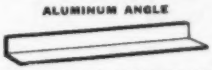
LANDING GEAR BRACKETS

Simply insert wire landing gear in holes at top of brackets and tighten set screws. Complete set of two brackets with screws, **50c.**

MODEL KNIFE

Handy tool; removable sharp steel blade..... **10c**
Extra blades, 3 for.....**10c**

ALUMINUM ANGLE



For motor mounts and many other uses. 1/16" thick: 1, 2, 3 foot lengths, ½"x½", per foot.....**15c**
¾"x¾", per foot.....**25c**

ALUMINUM TUBING

1, 2 and 3 foot lengths. ⅛", 3/32", 1/16", per ft. **10c**
3/16", ¼", ⅜", per ft. **15c**

SHEET ALUMINUM

12" wide, any length to 6 ft.
.001", .002", .003" 12"x12".....**15c**
.005", .010", 12"x12"..**20c**

SCIENTIFIC GAS MODEL FINISHES

Specially formulated for use on gas models. The finish on a gas model does a great deal in making a successful gas model. Don't take chances with inferior, low-priced finishes.

CLEAR NITRATE DOPE
COLORED NITRATE DOPE
NITRATE THINNER
HEAVY COLORLESS CEMENT
BAMBOO PAPER CEMENT
BANANA OIL

1 oz. bottle.....**10c**
2 oz. can.....**15c**
3 oz. bottle.....**25c**
4 oz. bottle.....**30c**
½ pt. can.....**50c**
1 pt. can.....**75c**

SPECIAL DESIGNED GAS MODEL PROPS

They are true pitch and designed for use on all gas models. Made of finest selected grade hard wood, two sizes 13" and 14". Special **$1.95** each

AIR SPRAY GUN

Operated by pressure from automobile tire. Complete outfit with long hose packed 1 set to box.

$1.50

KNIFE SWITCHES
Firm Contact.
2 poles.....**25c each**
3 poles.....**35c each**

SPECIAL MOISTURE-PROOF HOOK-UP WIRE

The finest on the market today. Oil, gas and water proof.
Price per foot.....**5c**
In packages of five feet.....**20c**

JACK and PLUG

The best way to hook up outside batteries. Can be unhooked in a jiffy by simply pulling out plugs. Per set..... **25c**

FINEST SPRING WIRE

Best and toughest rustproof wire. Extremely springy; fine for landing gears. In five foot lengths.
3/32" diameter, per length.....**15c**
⅛" diameter, per length.....**25c**

SCIENTIFIC PNEUMATIC RUBBER WHEELS

Same as included in Miss America and Red Zephyr kits. Lightweight, Puncture Proof.

For use on models with 3 to 8 foot wingspan. Black tires with aluminum colored hubs.
Size 3½". Per pair **$1.50**

It's Important to Know:—

When you buy your Gas Engine from Scientific it is backed by a

DOUBLE GUARANTEE

1—From the Engine Manufacturer
2—From SCIENTIFIC

Motors come packed in strong containers, guaranteeing you safe arrival in perfect condition. Every engine is thoroughly tested and is guaranteed to give 100% satisfaction.

HOW TO ORDER:

Kits are sent postpaid in U.S.A. Add 15c for packing and postage on ALL supply orders up to $1.50. On orders of $1.51 or over, add 10 per cent of the total for packing and postage.

Add 20c to all orders that contain balsa or wire in 5 foot lengths to cover special handling.

Retail orders of $4.00 or more are sent postpaid and insured in the U. S. A.

CANADIAN ORDERS: Add 30c for postage on all orders up to $2.00. On orders of $2.00 or more add 20 per cent of the total for postage and special handling.

STRIP BALSA
Five Foot Lengths

⅛x⅛	$.03
⅛x¼	.04
⅛x⅜	.06
⅛x½	.07
3/16x3/16	.05
3/16x½	.08
¼x¼	.06
¼x⅜	.08
⅜x⅜	.10
½x½	.12
½x¾	.15
⅛x1	.10
⅜x¾	.15
¾x1	.20
1x1	.25

SHEET BALSA
Five Foot Lengths

1/32x2	$.10
1/32x3	.15
1/16x2	.12
1/16x3	.18
⅛x2	.15
⅛x3	.20
3/16x2	.18
3/16x3	.25
¼x2	.20
¼x3	.25
½x2	.25
½x3	.35

GAS MODEL
Covering Materials

Bamboo "Airtite" Paper; Finest grade, highly efficient. Size 24"x36" sheet **10c** each 3 for **25c.**

"Zephyr" silk. Guaranteed finest quality Japanese silk obtainable for gas models. 30" wide, per yd. **40c.**

SCIENTIFIC MASKING TAPE

¼" wide; 3 feet on card with full instructions **5c.**

TOGGLE SWITCHES

A superior type switch for gas models. New type ball joint. Easy to switch. No sticking. **45c.**

MONOCOUPE 90A

50" Wingspan Length 32" Weight 10 oz.
Nothing like this New Monocoupe ever offered. Includes 12" prop and finished aluminum cowling. Colors: white, green and silver. Many unusual patented features.
Guaranteed to Fly 500 Ft.
$5.00 Postpaid or at your Dealer

CUSTOM CABIN WACO

60" Wingspan Length 43½" Weight 21 ozs.
Resembles the real ship in every detail. Kit contains everything including finished aluminum cowling. 15" prop, full size plans, etc. Colors: red and silver.
Guaranteed to Fly 500 Ft.
$6.00 Postpaid or at your Dealer

BEN HOWARD'S MR. MULLIGAN

Winner of the Bendix and Thompson Trophies in the same year. Kit features movable controls, bridge-type landing gear, finished cowling and crankcase, etc. Wingspan 25 inches.
Guaranteed to Fly 500 Ft.
$1.50 Postpaid or at your Dealer

FAIRCHILD "22"

50" Wingspan. Length 35". Kit includes newly designed landing gear built into Fuselage. Special shock absorbers in wheel housing. Colors: red and blue fuselage; yellow wing and rudder.
Guaranteed to Fly 300-750 Ft.
$3.50 Postpaid or at your Dealer

CURTISS P-6-E HI-FLYER

One of the famous Hi-Flyers with Bridge Type Landing Gear. Group also includes: Boeing Fighter, Waco "D," Mr. Mulligan, Curtiss Fighter, Grumman Fighter, Fokker D-7, Art Chester.
Guaranteed to Fly 500 Ft.
50c Postpaid or at your Dealer

DEALERS! Interest in gas models is now at its greatest peak! Stock up at once with Scientific Supplies and Kits and be prepared for your share of this new business! Write at once for details!

SCIENTIFIC MODEL AIRPLANE CO., 218-220 M-12 MARKET ST., NEWARK, N. J.

In England: H. & S. Norman, 46 Derby Rd., Kirkhams, Prestwich, Lanes.
In Australia: Swift Model Aircraft, 156 Adelaide St., Brisbane, Queensland.
★
In South Africa: Stratosphere Model Aircraft Supplies, P. O. Box 3248, Johannesburg.
In France: E. Kruger & Co., 9 Rue St., Sebastien, Paris.

have new training planes at Dayton under tests.

The Army has ordered three Curtiss low-wing pursuit planes.

Douglas have completed and are now test hopping their new 32 passenger flying boat: a double-decker.

An Army trainer version has been developed from the Curtiss-Wright coupe.

Piaggio of Italy has built two new transports of unique design.

Italy's new Cant Z.506 cruises at 160 m.p.h. with 12 passengers. It is equipped with floats and is very fast for that type of plane.

Roscoe Turner's new racer being designed and built by Lawrence W. Brown will be powered by a twin-row Pratt & Whitney engine.

Germany's latest Messerschmitt is a four-place low-wing cabin monoplane of all-metal construction. It has a top speed of 186 m.p.h. and is powered by a 240 Argus engine.

Consolidated is building a four-engined flying boat for the U.S. Navy.

More information on these and other airplanes will be included in next month's issue of MODEL AIRPLANE NEWS.

Build a Solid Wood Scale Model of the Folkerts Racer

Get dimensions from plans for purchasing stock. Make the entire model of balsa wood. It is best to purchase the wheels for landing gear. If you wish to square off the plans making it easier for measuring, connect the corresponding dots on border with straight pencil lines.

Draw the outlines of the wing panels, fuselage and tail surfaces on balsa wood. Be sure the grain of the wood runs lengthwise. Cut around the outlines with a jig-saw. Shave down the wing panels with a sharp, flat chisel referring to cross-sections on plans. Go over the surface with coarse sandpaper after chiseling and then smooth down with fine sandpaper.

In shaping out the fuselage, it is best to use a sharp razor blade. The fuselage cross-sections show sufficiently how to shape the fuselage. Take plenty of time and be accurate. Go over surfaces with coarse sandpaper and fine sandpaper. The landing gear installation will be accomplished later.

After cutting out the tail units, sandpaper them down to the correct thickness and smoothness. Pressing heavily so as to make a groove draw lines separating rudder from fin and stabilizer from elevators. Also draw ailerons in wing.

Go over the parts once more with fine sandpaper and begin the assembly of the model. Lay the fuselage in flying position on a flat surface. Connect the wing, applying plenty of cement where the two panels join the fuselage. Place blocks under the wing tips to hold them in place. Connect the tail surfaces in the same manner.

Using large gauge piano wire make the landing gear as shown in plans. Attach the wheels and wrap the ends of the wire with thread to keep the wheels from coming off. Cut out of fine grade cardboard the landing gear fairings and bend to shape. Cement these to the bottom of the fuselage.

The propeller is made by first cutting out the small spinner with your razor blade. Then shape out to blades from flat pieces of scrap wood and cement them to the spinner at the correct angle. Insert a straight pin through the center to act as shaft and then attach the prop to the nose of the fuselage.

Shape out an airspeed indicator and cement it to the leading edge of the wing. A tail skid may be made from a small piece of wire.

Once more go over the entire model with fine sandpaper. Brush off the dust thoroughly and begin the paint job. The areas with diagonal lines on the three-view drawing should be doped a dark brown and the rest a dark yellow. Several coats will have to be applied before a smooth finish is obtained. Do not apply a second coat until the first has dried. Paint the number one brown and the wheels, exhausts and other trimmings black. The model will then be completed.

Building a World Record Fuselage Model

(Continued from page 13)

trailing edges and cementing on the ribs.

When the left and right wings and also the center section are finished, join them together carefully and accurately. The 4" dihedral of the wing is formed by using wood blocks or books. The wing tip is raised to form a 4" dihedral by putting blocks underneath the tips. Use plenty of cement on all the joints and check the 1½" sweepback on the wing.

Empennage

The tail and rudder are built in the same method as the wing. Ten ribs from 1/32 sheets are cut to shape and cemented on the trailing and leading edges of the tail. Double ribs are used in the middle of the stabilizer and bamboo rods are cemented on to receive the rudder. Bamboo tips curved from 1/16 square are cemented on before adding the center spar.

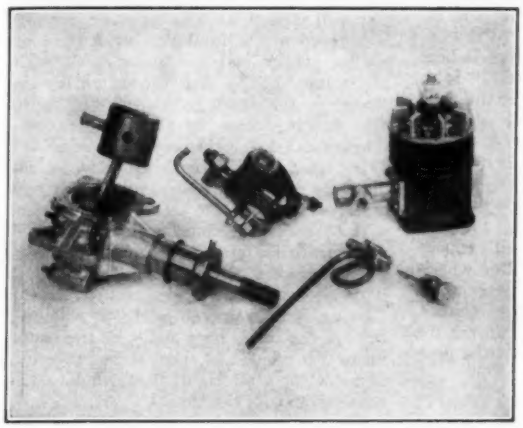
The rudder is of streamline type. Five 1/16x⅛ ribs are cut to size and cemented on. It is streamlined after the whole rudder is finished, that is when all the ribs are cemented in their proper places. Remove the rudder from drawing then streamline the ribs by using a razor blade. Cut down the rectangular ribs to form the streamline shape as shown in the drawings, and finish with fine sandpaper.

Propeller

The propeller used on the record model was a 17½ one, having a pitch of about 25". The block was 1¾x2¼x17½. To make this prop, select a block of the medium hard grade of balsa and mark out the prop block as indicated in the plans. With a jig-saw or sharp knife, cut out the outline and carve the prop so that the blades taper from ¼" at the hub to 1/16 at the

G.H.Q. GAS KITS

Continued up to Xmas—by overwhelming demand!



Well—we're quite frank to say that we just couldn't discontinue the sale of G.H.Q. Gas Kits. So overwhelming was the response to our announcement of last month—so anxious are additional thousands of men and boys to obtain Gas Kits that we are extending our offer up to Christmas only—positively not beyond that date.

Only six months ago, G.H.Q. blazed new trails in model airplane history with the news that a super-power engine may be had at $8.50 for a limited time only. Thousands of delighted men and boys availed themselves of this unusual opportunity during this period of time. We have decided therefore that we are now at liberty to withdraw this temporary offer and discontinue the delivery of all G.H.Q. gas motor kits after Christmas—selling finished motors only thereafter. Here is your last chance to obtain the G. H. Q. Motor Kit, an engineering triumph—accomplished only after years of scientific aero-dynamic research. Thousands of letters have poured in from all parts of the country praising and recommending this mechanical achievement and the thrill of a lifetime will be yours with this motor kit—one of the most powerful ever constructed. Has broken records for amazing performance—flies model planes up to 10 ft. wingspread. Also used for boats and stationary use. Easy to start and simple as ABC to assemble.

Everything is in the kit including plug, coil, condenser, tank, ignition wire, cylinder, piston, connecting rod, timer, crankshaft, all screws, nuts, bolts, etc. No oil, gas, batteries or propeller included. Postpaid for only.....

$8.50

AND THESE FEATURES MAKE THE G. H. Q. MOTOR A WINNER!

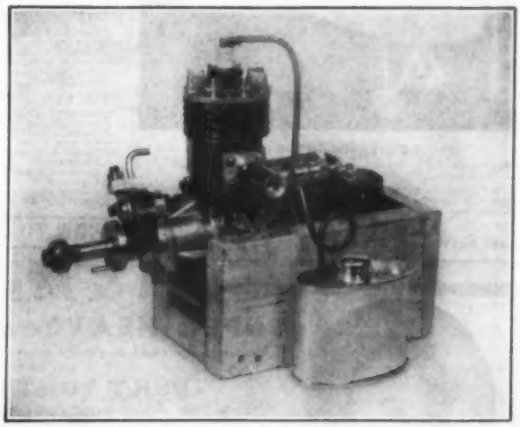
1. Steady running—as long as gas, oil and spark are supplied.
2. Motor cannot overheat.
3. Precision parts.
4. All parts replaceable.
5. Cylinder and piston lapped.
6. Accurate die castings.
7. Crank shaft balanced and perfectly machined.
8. A light spark coil that is oil, water and gas proof.
9. Coil will not overheat or short circuit.
10. Main bearing is high-speed bronze, ground and lapped to size.
11. Condenser is gas, oil and water proof.
12. Cylinder and piston inspected cast iron to insure long life.
13. Chrome nickel steel shaft with 1¼" bearing surface.
14. Connecting rod of high speed bronze.
15. Carburetor and assembly accurately designed and made.
16. Needle valve and valve body machined together.
17. Breaker assembly compact, foolproof, long wearing, replaceable and adjustable.
18. Easily inverted and runs in either direction.
19. Motor starts and runs on 2 ounce battery.
20. Speed range 500 to 10,000 R.P.M.
21. Low gas consumption—runs 27 minutes on one ounce of gas.
22. Strongest miniature motor.
23. LOWEST PRICE EVER SET.

READY-TO-RUN G. H. Q. GAS MOTOR

The famous G. H. Q. motor, entirely assembled on stand. Tested and run before shipment—Performance guaranteed—1/5 horsepower at 3000 to 7000 R.P.M.—No oil, gas or batteries included. Postpaid for only .....

$12.50

FREE with every finished motor, 1 finished flywheel mounted on motor. This offer not for dealers.



HERE IS NEWEST G. H. Q. SENSATION!

The G. H. Q. Sportster kit especially designed for G. H. Q. Gasoline Motor but may be used for any other motor of like weight and power. Built according to scientific aero-dynamic principles — Has made hundreds of successful flights without crackup—Marvelous glider . . . And what a climber!

A complete kit of all parts including plan, all wood, wire, wheels, metal and all other parts. Postpaid for only..... **$5.00**

"IT'S WORTH TWICE AS MUCH'

Sept. 4, 1936.

G. H. Q. Model Airplane Co.,
564 Southern Blvd., New York, N.Y.

Dear Sir:

I just want to tell you how satisfied I am with my G. H. Q. gas motor. It runs perfectly and starts very easily. I don't know how you can sell it so cheaply—I think it's worth twice as much. Very truly.

George Ramasek.

Send 3c for illustrated catalog of gasoline motors, gasoline planes, gasoline accessories and parts

We have a complete line of kits from

10c to $1.00

A Guarantee

G. H. Q. machinists have successfully constructed hundreds of finished motors from the kits without having had any motors which did not operate satisfactorily. Should any purchaser be unable to assemble a working motor he may return parts to us with $4.50 (charge for assembling and postage) plus cost of any damaged and missing part. Finished motor will be shipped in a few days.

G. H. Q. MODEL AIRPLANE CO.

854 East 149th Street
NEW YORK, N. Y.

tip. Both blades should have ¼" camber, without fail. Be sure to take plenty of time and great caution, because a poorly made prop may reduce your flying time.

The free wheeling is made of .040 and .028 music wire. Cut a piece of 3/32 o.d. aluminum tubing that will extend about 3/16" out from the front end of the propeller and insert it in the center of the prop hub. Take great caution in doing this, because the prop is liable to split. Cement the tube well at each end and insert in each end a bushing.

The wire hinge-like arrangement is bent from .034 wire. Insert one about ¾" from the center, on the leading edge of the prop and cement securely. The prop shaft is bent from .040 wire, with a hook at one end and a loop at the other end for the free wheeling. To assemble shaft on to the prop, pass the wire shaft through the nose plug, and 3 large washers. Put on the prop and bend the wire shaft, then with round-nosed pliers, bend the loop for free wheeling. Finish the prop by sandpapering it and then cover it with any desired tissues.

To wind the motor by hand, insert the loose piece of wire in the loop of the prop shaft.

Covering

The original model was covered with two colors, red and yellow. The center of the wing (center section) was entirely red and from the center rib to the 5th one of each side with yellow, while the rest of the wing was red. The fuselage was entirely red. The tail yellow and the rudder red.

Use a mixture of 66 2/3% dope and 33 1/3% acetone to cover and dope the model; two coats of dope on the tail and rudder while 3 coats on the rest of the plane. When doping the empennage, take great caution because it is liable to warp.

Flying

Assemble rudder onto the tail and then place the whole empennage onto the fuselage. Be sure to have them on tightly or they will fall off while in flight. The wing is fastened to the fuselage with a piece of ⅛ flat rubber and the motor stick with 16 strands of ⅛ flat brown rubber is placed in the fuselage with 2 "U" wire clips holding them in at the nose plug. Check the 3/16" incidence on the wing and 3/16" at the tail. Incidence may be reduced by use of light wood on prop or any other parts.

Hold model in hand and glide model until a nice flat glide is obtained. If model stalls, reduce incidence at the tail and if it dives, increase it.

When a flat smooth glide is obtained, remove the 2 "U" clips and wind the motor up to 300 turns, and then let her take off. If model acts all right, then wind to full capacity and let her go.

Go to it!

Building The Darmstadt D-22

(Continued from page 19)

only are shown in drawings, but these may be easily duplicated for building the other two panels, which are identical. The leading edge of both wings is cut from ⅛" sheet balsa, sanded to proper cross-section after wings are built. Take care that the end rib on each wing panel is at the same angle, so that when the wings are connected to each center section later, the dihedral will be the same at each tip. When the lower wings have been built, fasten the ailerons in place with the copper wire hinges, as indicated. After finishing the structure of the top wing center section, it may be followed by the lower wing center section, which is covered with 1/64" sheet balsa on top, upon which it is later mounted and the fillet built on same likewise.

Tail Surfaces

The stabilizer may be constructed first. Its parts are made from 1/32" sheet balsa, with the exception of the spars which are cut from 3/32" sheet stock. The rudder and fin are of the same construction as the stabilizer and elevators. When both surfaces have been completed, join together with the copper wire hinges which were used in the aileron installation.

Landing Gear

All stock used in the landing gear should be as hard as possible, as this unit is prone to receive more abuse than any other part of a model. The side struts which carry the dummy shock absorbers are made in two pieces. See drawings for this detail. The two sections of each are joined on top of the absorbers, using a piano wire brace internally. The proper cross-section of all struts is shown on drawings. The front inner struts are of 1/16"x⅛" balsa, while the rear inner struts are of ⅛"x¼" stock. Do not build the landing gear on fuselage

SELLEY-TEX
PATENTED

NEW — The MOST REALISTIC MODELS EVER CREATED — VALUE

OUTSTANDING in DEVELOPMENT and REALISM
NOW ALL CAN AFFORD These Exclusive FLYING MODEL KITS

These sensational new type moulded SELLEY-TEX authentic Flying Scale Models stand supreme. They are the first outstanding development in all model history. They build better, and more realistic looking models and can be assembled in half the time it would require to build the old-fashioned balsa-stick-type of construction kit which are now being sold by all other manufacturers.

WHAT IS SELLEY-TEX?

SELLEY-TEX is a new finely woven processed material, that is moulded in the form of stiff hollow shells, reproducing in perfect detail, fuselage, cowls, motors, pants, bombs, etc., that are supplied with each kit. It is extremely light in weight and practically crashproof. A SELLEY-TEX fuselage is twice as strong and half the weight as an all-balsa-stick-type fuselage of the same size and detail. A beautiful finish can be had with either colored dope or lacquer. Choose any SELLEY-TEX kit and you will find that it is the easiest to build and the finest authentic model ever produced.

SELLEY-TEX OFFERS 10 ADVANTAGES OVER ALL BALSA STICK KITS

1—**MOULDED CONSTRUCTION.** First real advancement in practical building.
2—**EASIER-TO-BUILD.** The moulded parts make it simple as ABC.
3—**EXCLUSIVE FABRIC.** Specially close woven and processed by secret formula.
4—**MORE PRACTICAL.** Selley is discontinuing Balsa Stick type entirely.
5—**MORE AUTHENTICALLY DESIGNED.** Minute details are moulded into model.
6—**MORE DURABLE.** The moulded shell is stronger and lighter.
7—**BETTER FLYERS.** The moulded fuselage eliminates weight behind center of gravity.
8—**POSITIVE MEANS OF BALANCING.** Simple ring device correctly balances plane.
9—**FINISHED ADJUSTABLE PITCH ALUMINUM PROPELLER.** Maximum of thrust and minimum of rubber. *In De Luxe Kits only*
10—**FULL MONEY BACK GUARANTEE.**

NEW AERONCA
16" Wing Span

50c *10c Postage*

1.25 *10c Postage*

LOCKHEED ORION
Wing Span, 20" Length 12¾"

REARWIN SPEEDSTER
Wing Span 16" Length 16"

75c *15c Postage*

BELLANCA SWOOP

1.00 15c Postage

Wing Span, 20" Length 11½"

EVERY SELLEY-TEX KIT CONTAINS:

The necessary moulded fuselage sides, cowel, pants, bombs, meter, etc., and are packed in a beautiful sturdy box.

Sawcut propeller, scale propeller parts, formed wire hooks, scaled wheels, brass bushings, printed cut ribs on balsa, turned wood parts, tail wheel fork fittings, wire, para rubber motor, colored paper, Authentic markings, colored insignia, cement, colored dopes and easy to understand plans.

SELLEY-TEX DE LUXE CONSTRUCTION KITS ALL 24-inch Wing Span

FAIRCHILD "22"

RYAN SPORT

3.00 EACH *25c Postage*

WACO "C"

BOEING-F4 B4

3.50 EACH *25c Postage*

WACO D MILITARY

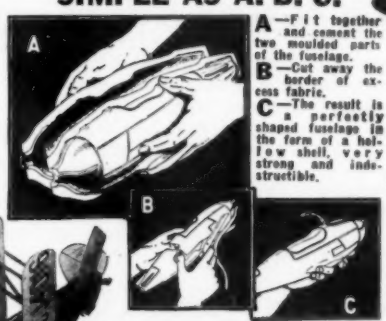
4.00 EACH *25c Postage*

DeLUXE KITS

Come complete with all the tools for assembling—RAZOR, CLAMPS, BRUSH and SANDPAPER.

GOSHAWK

SIMPLE AS A. B. C.



A—Fit together and cement the two moulded parts of the fuselage.
B—Cut away the border of excess fabric.
C—The result is a perfectly shaped fuselage in the form of a hollow shell, very strong and indestructible.

Each of the SELLEY-TEX Construction Sets contain the necessary individually designed moulded scale parts similar to those shown below.

Selley-Tex Moulded Parts for Goshawk
All SELLEY-TEX moulded parts are beautifully finished.
1—Right fuselage shell
2—Left fuselage shell
3—Belly tank
4—Drag ring
5—Balancing ring
6—Motor
7—Bomb shells
8—Head rest
9—Pants shells, R. & L.
10—Bulkhead
11—Pants fairing
12—Tail wheel fairing

MONOCOUPE
Wing Span, 20" Length 12½"

VOUGHT CORSAIR, JR.
Wing Span 18" Length 13¼"

1.25 EACH *15c Postage*

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SEE OUR AD PAGE 4

until the fuselage has been covered with tissue, to insure easy handling. In making the axles, use the No. 18 piano wire, installing them as indicated and wrapping with silk thread. The wheels, which are 1⅞"..in diameter, were purchased from a model supply house for the original, and are celluloid.

Propeller

Secure a balsa block, medium-hard, and size ½"x1¼"x9" for this. First, cut the block as shown in the front view and follow with the tapering of the ends, as shown in side view. Notice that the rear section of the spinner is carved integral with the propeller itself, and a cap is made to finish it off and which is cemented to the front face later, when carving is completed. The propeller designed for this ship will have a very efficient helical pitch for good steady flying, if the above directions are closely followed. It should be drilled for the No. 18 wire shaft, which is, incidentally, installed in the rear part of the spinner before the cap is cemented in place. A dural washer is put in the rear to act as a bearing against the nose plug bearing. Finally, connect the propeller and plug together as a unit.

Covering

As the next step, begin the covering of the various parts. Mino tissue is recommended for this, as it adheres excellently when clear dope is used as paper cement, and produces a fine, smooth finish after the application of the colored dopes. The fuselage is covered with strips of tissue which are applied horizontally along fuselage, until completely covered. The shell is then given two coats of clear dope. In preparing the upper and lower wings for covering, they should first be connected to their center sections, making a good joint at the four points. All wing surfaces may now be covered. When the paper has been water-shrunk, apply two thin coats of clear dope to them. When tail surfaces have been covered, give them two coats of thin clear dope as you did with the wings, water-shrinking the paper first, of course. All surfaces should be installed after the colored dopes have been applied, as a much simpler task of painting will result from such a procedure.

Coloring and Assembling

The color scheme presented is exactly as applied on the Darmstadt whose coloring arrangement was copied, as explained in the introduction of article. The whole ship is painted in black and white, which produces excellent contrast and beauty.

In preparing the fuselage for the paint job, first apply white patches in the areas where the white license numbers and insignia appear. Now mark off all such lettering, using a pencil and drawing the outlines lightly. When completed, proceed to paint the black portions of the fuselage. When approaching the lettering areas, it will be noticed that a fine even line may be struck with the black dope around the edge of the letters, which is much easier than attempting to paint the white lettering *over* the black. When fuselage is completed in the black and white, install the landing gear and wing struts in the proper positions, after which they too are to be covered with tissue, which all makes a smooth, high gloss finish possible. The two windshields should now be made and cemented in place. The landing gear and wing struts may be painted next. Both of these units are white. The propeller which is also covered with tissue, can be painted now, and is white in color also. It is suggested that the photos be studied for a complete understanding of the very odd color arrangement of this plane.

The tail surfaces are finished in the type marking required of German planes having commercial use. Mark off the parallel rows with a pencil and ruler first. Next, secure a common drawing pen from a drafting set, in which black dope is placed in place of ink. Proceed to line the empennage with the black, after which the black stripes are filled in with a brush, now in outline form. The white striping is now painted in in the remaining uncolored bands. Now that the empennage has been painted, it can be secured in position. The stabilizer is first securely cemented to its seat and the capping section cemented over it. When dry, cement the fin in position, being sure that it is at right angles with the stabilizer. The stabilizer brace struts are 1/16"x⅛" balsa, and should be cemented in position at this point. It will be found necessary to retouch the empennage with paint in several places after the cementing of the parts has been finished.

The wings carry a unique coloring method. Notice that the license numbers overlap onto the black front strips of each wing, changing from black to white in doing so. When each wing is completely painted, begin the assembly of each plane by first installing the lower wing, which is cemented in place in the section removed for the purpose in the bottom of the fuselage. Prepare a solution of corn starch and clear dope, which will be found to be an excellent agent for reproducing the wing fillet, being as smooth and easy to work as putty and yet drying rapidly. This too,

upon completion, is covered with tissue, after which it is clear doped and then painted black, to blend in with the fuselage. Caution should be taken in making sure that the lower wing shows equal height from a table, at each tip, and lines up with the stabilizer at the same time. The top wing is certainly simple enough to install, being merely cemented to the lone center wing struts. Be sure that these joints are heavily cemented. To complete the assembly, install the brace wire between the first two struts, as shown on front view assembly drawing. It is heavy thread, to be painted white.

Flying

The original model flew well from the first, requiring no nose weight, the elevators being used with slight adjustment to give it the proper flight attitude, however. In preparing for flights, it should first be tested for gliding which is done in the usual manner. A grass-covered field is ideal for flying it. It should fly with a moderate clip, having a long steady climb which is steep enough at times to insure many thrills. Use from 6 to 8 strands of 1/8" flat rubber for the power, which may be varied for a variety of flight results.

A Scale Model of the Boeing YP-29

(Continued from page 7)

made of plastic wood or of glue. The glue method is an idea the author thinks he originated as he has never heard of any one else using it. The procedure is: place large amounts of glue (cellulose) in the cracks between the stabilizers and the fuselage taking a little care to make it the general shape of the fillet. Let this dry thoroughly and apply another coat of glue if it is deemed necessary to make the fillet larger. After the glue is dry, carve to shape of fillet with a sharp knife or razor blade. A rat-tail file and sandpaper should be used to finish it to the proper shape. This method should only be used where fillets are too small to be made of plastic wood. A little care and practice will yield a good-looking fillet.

Engine and Cowl

These parts may be bought from a model supply house or if greater accuracy is desired, they can be made by the builder. The cowl should be turned on a lathe to the outside shape and then with a jig-saw cut out the inside. This will give a ring that greatly resembles the real ship's cowl. The engine should be made in the usual manner. Place a disc on the front of the engine the size of the service cowl. Sand between the cylinders to obtain the "bumps" that are at the front of each cylinder.

Miscellaneous Parts

The landing gear can be made retractable if the builder wishes to use a little ingenuity and effort. Or it can also be made permanently retracted and mounted upon a pedestal. This makes a very attractive mount.

The cockpit is perhaps the most difficult part. It may be made from a solid piece of balsa carved to the proper shape with the windows painted white or silver. This method is recommended for a small model.

Another way is to make it of individual pieces of celluloid glued together. The metal seams can be made of bond paper painted olive drab. The author has made a number of enclosures in this manner and they look very realistic.

Next is the assembling of the model. The wing can be mounted with pegs and then filleted. The fillet may be made of plastic wood or carved from a solid block. This last method is used by the wind tunnel model builders of the Boeing Airplane Company. With a little care, using this method, a nice-looking fillet will result. This method is best applied to models of over twelve inch wingspan.

Painting

The model should be painted olive drab and yellow. In painting the ship, care should be taken in not applying too much paint as it will clog up all the detail. The stars and stripes are the usual red, white and blue colors while the wing walks are black. The wheels have silver discs. Just a word about the rubber protection strips on the stabilizers. This is a coat of thin black paint over the usual yellow.

In closing, the author would like again to stress the points about accuracy and patience. Take care in building each individual part and the finished model will look better than if it were rushed to completion. Remember: A chain is as strong as its weakest link. This means, your model will be only as good as its poorest parts.

Designing Your Model for Speed

(Continued from page 9)

span in order to insure directional stability. An average length for the moment arm is 1¼ times the wing span. It may have a length as large as 1½ times the span or it may be equal to the span as a minimum value.

The length of the fuselage nose from the center of the wing to the propeller bearing may have a value of one-half to one-third the moment arm. This depends upon the weight of the nose and the landing gear. The heavier they are the shorter the nose may be and still have the model balance correctly at a point which is one-third of the wing chord length to the rear of the leading edge of the wing. Apparently for efficiency's sake, the landing gear should be light but often a light landing gear necessitates a long fuselage nose which creates larger resistance and greater weight in the end.

Considering speed alone, the tail surfaces should be as small as possible, for the smaller they are the less resistance they offer. Actually the only reason why tail surfaces are used at all is to insure stability. Therefore their proper size will be determined when the element of stability is considered later.

Location of Wings for Speed

The location of the wings relative to the line of thrust and the center of gravity is very important. The factor which governs the position of the wings is the trajectory or path of flight that is required in a speed plane. The flight path must be close to the ground rising very gradually from the starting point to a maximum height of about five feet and descending gently to a point *beyond* the finish line.

Let us see what the wings have to do with this. First of all in order to produce a flight trajectory as described above, the line of resistance must be coincident with the line of thrust or slightly *below it; not above it.* Thus under high speed the plane is not nosed up into a climb as it would do if the line of resistance was above the line of thrust. As you may realize, the wings cause considerable resistance and therefore their position has a great deal to do with the location of the center or line of resistance. Thus as a low line of resistance is required it becomes obvious that this may be obtained only when the wing is comparatively low. On speed ships the wing roots should intersect the fuselage below or approximately at the line of thrust. When considerable dihedral is used, the wings should be extremely low.

The landing gear has considerable to do with the location of the center of resistance. At high speeds the drag is large

though it may be well streamlined. This drag tends to nose the plane over and thus indicates that it helps to produce a low line of resistance. Obviously the longer the landing gear the more resistance it will cause and the lower the resultant line of resistance will be. Thus, the *longer*, the landing gear the *higher* the wings may be located *relative to line of thrust.*

Stabilizer Angle

As the force couple generated by the high thrust and low drag causes a nosing over tendency when the ship is under power, it is obvious that some factor must be introduced to cause a *slight* nosing up tendency to balance this couple and produce the gradual and gentle climb desired. This is accomplished by setting the tail surfaces at a slightly *negative* angle to the air stream. This means that it should be set at *zero degrees* to the line of thrust or at about *one degree* negative. At zero degrees it will have a slight negative effect due to the down-wash of the air from the wings. In this fashion the nosing up effect of the negative tail can be made to counteract the nosing down tendency of the high thrust line and a flat flight trajectory may be obtained. The important fact here is that both the nosing down and nosing up effects are proportional to the speed of the plane and balance each other at the various speeds incurred by the drop in the power from start to finish of the flight. By making the nosing up effect slightly the larger of the two, a gentle climb and descent may be produced.

Angle of Incidence

Now an accurate and effective angle of incidence may be given to the wings. In all airplanes the wings must have a greater angle of incidence than the horizontal tail surfaces, except in rare cases of extremely high parasoled wing ships. If the stabilizer is set at one degree negative, the wings should have an angle of incidence of about zero, or one degree *more positive* than the stabilizer, for a one degree longitudinal dihedral is large enough for a speed plane. If the wings are fairly high relative to the line of thrust, the longitudinal dihedral will have to be less, unless too much nosing up effect is to be produced. This means less longitudinal stability. Therefore it is advisable to keep the wings low and the longitudinal dihedral correspondingly large. In cases in which the stabilizer is set at zero degrees, the wings will have to be set at *one-half* to *one degree* positive angle of incidence (measured from the line of thrust.)

C. of G. Location

On a high speed plane a nosing over effect or a steep glide at the end of the flight would be disastrous. In order to prevent this and insure a nosing up or squashing effect at the termination of the flight, the center of gravity should be located *below* the line of thrust. It need not be located far below it but merely slightly so.

As a rule a low center of gravity naturally results from placing the wing low, so usually this factor gives little worry to the designer. This arrangement also insures a low center of lateral area which is greatly desired.

Now all the speed characteristics of our model have been established, except as regards the propeller and motor. The proper force set-up and arrangement of the parts of the plane as outlined is shown in Fig. No. 120. This general design should characterize all speed models of the tractor variety. It is interesting to note that it is similar to the type used for large high speed planes such as the Boeing P-26A and other low wing pursuits so popular at the present time.

Speed Propeller Characteristics

Obviously the power plant and propeller are extremely important in the operation of a speed ship for one generates and the other transmits the force which produces the forward motion of the airplane. Let us consider the characteristics our speed model propeller should have. First of all, what should the diameter be? To give high speed to the plane it should be as large as possible, so that a very powerful motor may be used without having such a high rotational speed that the motor is all unwound before the plane has covered any appreciable distance. However, if the diameter if the propeller is very large compared to the wing span, so much torque will be generated that the wings will not be able to cause enough resisting moment to prevent the plane from rolling over sideways. Therefore it is apparent that a happy medium for the diameter must be established. Through tests it has been found that *a propeller diameter of forty per cent of the wing span* will deliver great power without excessive torque. A smaller di-

ameter may be used but a larger one is not advised.

Propeller Pitch

It is also of great importance to have the proper amount of pitch on the propeller blades. If the pitch is low, the propeller will have a quick get away but will waste power because of excessively high rotational velocity when the model is in full flight. On the other hand a very high pitch will "gear up" the propeller so that a rubber motor of very large cross section will have to be used. Not only this but excessive torque reaction will result. In such a case the model would get under way slowly and would have a tendency to turn or not fly a straight course. Therefore a propeller of medium pitch is superior to any other one. A pitch of *one and one-half times the diameter* is advisable.

Propeller Blade Area

Nine out of ten model builders make their biggest mistake when it comes to assigning the correct blade area to their propeller. The general rule for the average plane is to make the blades with an area equal to 10% of the wing area. In the case of a speed model this value is entirely too small, for the total drag of the ship is *much greater in proportion to the wing area* than in a slow flying model. Thus more blade area is needed in proportion to the wing area. For proper results the blade area of the propeller of a speed model should be from 15% to 20% of the wing area. Too much slip and resulting inefficiency is incurred if it is less than this amount. For postive results a blade area of 20% of the wing area is advised. This will induce a fast take-off and a minimum torque reaction while the model is in full flight.

Feature which help to reduce the drag and increase the speed of your model, and stability consideration will be discussed in full in next month's article. Don't miss it.

Pursuit Planes of the U. S. Army

(Continued from page 6)

least, seen the most satisfactory service.

The Curtiss Aeroplane and Motor Company has made almost one half of all the pursuit types used in this country, having manufactured a total of 15 distinct designs in the new "P" series. Boeing is second with 8 designs, Consolidated next with 4 designs, and Lockheed, B/J and Thomas Morse with one each to their credit.

The Curtiss "Hawk" has gained world wide renown because of its excellent record of service in the Air Corps. Previous to 1925 when the P-1 appeared, the single place combat ships had been known under the designation of "PW" or Pursuit-Water-cooled. PWs were made by the following firms: PW-1 Army Engineering Division, PW-2 Loening, PW-3 Ordnance Engineering Co., PW-4 Gallaudet, PW-5 Fokker, PW-6 Fokker, PW-7 Fokker, PW-8 Curtiss and PW-9 Boeing. We will cover only the later series of "P" ships however as they are of more recent manufacture and in themselves constitute a complete picture of the Army's developments along these lines.

The P-1 built by Curtiss was of the same general type as previous Hawks but used only one set of interplane struts rather than the two bay arrangement previously featured. Modifications of the P-1 soon appeared. The P-1A had new accommodations for oxygen and parachute while the P-1B had bomb racks and larger wheels with internal brakes. Twenty-five of each of these types were delivered to the Air Corps. It is interesting to note that even at this early date the Curtiss Company had its eye on export markets. 8 P-1Bs were sold to Chile while one went to Japan. The Curtiss D-12 engine of 375-435 horsepower was used in all of these Hawks. Other P-1s included the P-1C, D, E and F, all essentially the same as the first model but having internal modification and improvements in gunnery, oxygen equipment, etc. The P-1B had a top speed of 170 miles per hour and reached an absolute ceiling of 22,200 feet.

In order to get better performance, the next Hawk ordered by the Army and known

as the P-2, was fitted with a 500 horsepower Conqueror engine. Top speed was raised some 15 miles per hour over the P-1 by this change. 5 P-2s were delivered in 1927 and could be changed to P-1Bs simply by switching engines.

1927 saw much advancement in pursuit design and performance. The first air-cooled pursuit appeared in that year. This job, the P-3 Curtiss, used a 400 Wasp engine. 5 P-3As were ordered for service testing and saw considerable service up to a few years ago.

The Boeing Company made its first pursuit ship in the new series in the same year and patterned it after the successful PW-9 of some years previous. With the Curtiss P-5 Hawk, this Boeing XP-4 did much of the experimental high altitude work which has enabled our army engineers to design more efficient pursuits. Although the Turbo-supercharged Packard engine wasn't entirely a success it was a step in the right direction and was the forerunner of our highly supercharged 1,000 horsepower machines of today.

The Curtiss P-5 "Super-Hawk" was in general design a P-1B with Turbo-supercharger placed on the Curtiss D-12 engine. Much study was devoted on the subject of pilot comfort at high altitude in this ship. One of the first electrically heated cockpits was incorporated in the design of this ship. Top speed of the P-5 was 187 miles per hour at 20,000 feet, a considerable improvement over other pursuit types in use. A P-5 held the world's altitude record for ships of its category for some time as well.

The evolution of the Hawk next takes us to the P-6, perhaps the most famous of this series. With the possible exception of the P-12 series built by Boeing, the trim taper-winged P-6s are probably more universally known than any other American single-seater. The XP-6 used a 600 horsepower Conqueror engine for its power plant and had a top speed of over 190 miles per hour. The XP-6A, a specially built racing job, seemed a backward step in many respects as it differed but little from the PW-8s. Straight wings, surface radiators and high pressure tires were some of its features. At the Spokane Air Meet in 1928 it averaged 201 miles per hour over the speed course. This was the fastest pursuit plane in the world at the time. Other P-6 types have appeared, many of them little known to the public. The standard P-6 type as adopted by some of the pursuit groups in the middle west for a time used a 600 horsepower Conqueror and had a huge underslung radiator. The P-6A was merely a P-6 with Prestone cooling and consequently smaller radiator surface. The XP-6B was the "Hoyt, Nome to Washington, D.C." plane piloted by Major, then Captain Ross Hoyt, and was fitted with extra oil, and gas tanks as well as a full set of instruments. The P-6D, of which 3 were made, was another venture into Turbo-supercharging by the Curtiss people. Capt. Rueben C. Moffett of Wright Field flew from Dayton, Ohio, to Washington, D.C., in one of these ships at an average speed of 266 miles per hour. The hop was made at 25,000 feet. In spite of the excellent performance put up by this ship it was not found entirely satisfactory and only 3 were built. The P-6E, which has been used in large quantites, has a single strut landing gear, three bladed propeller and many new features, among them full wheel pants and a tail wheel. A Conqueror V-1570-C engine is used giving the ship a top speed of 198 miles per hour at sea level. It is not intended for high altitude work, having an unsupercharged engine. A range of 570 miles is obtainable by using a small droppable belly tank. One P-6E was equipped with a Turbo-supercharger and full cockpit enclosure and given the designation XP-6F. It is still under experiment and has reached speeds in excess of 250 miles per hour. A power output of over 700 horsepower is credited to the new type Conqueror installed. The last of the P-6 series and a ship about which very little is known, is the XP-6H, multi-gun pursuit. It carries an armament of 6 machine-guns and is literally a "flying fortress." One other type P-6 is in use, the P-6G, and differs only from the P-6E in internal structure and engine improvements.

As we are taking the history of Air Corps pursuit planes in numerical order rather than in order of years, we must jump back a few years to the Boeing XP-7, the next in line. This job was nothing more than a Boeing PW-9 with a Conqueror engine in place of the usual Curtiss D-12. It was produced experimentally only and not put into production.

The XP-8 was still another Boeing ship which incorporated in its design many of the PW-9 features. It was the only pursuit ship to use the inverted Packard engine

and was for a time the fastest single-seater in service. It was known as Boeing model No. 66.

Soon after the Boeing Company constructed another experimental Army single-seater, known as the XP-9. It was the first all-metal stressed skin monoplane in pursuit aviation. Fuselage design was much like the later P-12E, being all metal semi-monocoque construction, while the tail was of corrugated sheet dural. A 600 horsepower Conqueror drove a two-bladed propeller. This ship was what might be termed a "dismal failure" but nevertheless it served to acquaint the Air Corps with many points worthy of study. Considerable trouble was experienced in getting full horsepower from the Conqueror engine and the flying characteristics of the ship were not at all suited to pursuit aviation.

Curtiss branched from its usual line of tapered-wing "Hawks" in building the XP-10. This ship, one of the Army's first gull-wings, had nice lines and a good performance but was not chosen as a service type for various reasons, the main of which was probably its vulnerability to gunfire. Surface radiators were used, a type now discarded as being impractical for service aviation.

In its search for an ideal single-seater, the Air Corps has tried many engines of air-cooled and liquid-cooled types. One of the most interesting power plants used was the Curtiss Chieftain 12 cylinder twin-row radial. It was unique in that the rear bank of cylinders was directly behind the front bank, and not staggered as is the practice today. Three XP-11 pursuits were equipped with these power plants, which developed 600 horsepower, and were exactly like the P-6 except for this engine. Two were later converted into P-6s in fact and one was made into a YP-20. Top speed of the XP-11 was 185 miles per hour and service ceiling was 26,700 feet.

The trim Boeing P-12s are known throughout the world. These little biplanes have been favorites of pilots for many years and have constituted, along with Curtiss Hawks, our main pursuit force for some time. Their development takes us through no less than 10 distinct types. The first, known as XP-12, was heralded as the greatest advance in military aviation in years. Constructed of dural tubing and having wooden wings with metal controls, it showed a top speed of 171 miles per hour. Ceiling was 29,000 feet fully loaded. A 450 Wasp engine powered the ship. One XP-12A was made as a test ship for the then newly developed NACA cowling. The fuselage was faired out to conform to the enlarged nose and a shorter landing gear was used as well. It was totally destroyed in a crash at a later date.

The P-12B soon made its appearance, being an exact copy of the P-12 but having Frise balanced ailerons and new internal improvements. The P-12C and P-12D, made still later were further improved and had a heavier cross axle landing gear, ring cowls over the engines, which were incidentally of higher horsepower. Many of these Cs and Ds have been fitted with "E" type vertical tails as they were found to give better control. The entrance of the P-12E into the Air Corps marked the first monocoque single-seater to be adopted for general use. The use of metal made possible not only better streamlining but also made repairs easier and also afforded better protection to the pilot in combat. Not only are their structures less likely to fail if pierced by gunfire but their all-metal skin is invulnerable to incendiary bullets. Speed took a forward jump with the introduction of these many innovations and the P-12E sped along at over 189 miles per hour and reached a service ceiling of 27,000 feet fully loaded. The P-12F, an improved type with a 550 horsepower Wasp in place of the 500 as used in the E, hit a top speed of 194 miles per hour and could climb to 32,000 feet. Other P-12 types which have appeared have been mainly for testing purposes and were not made in quantity. One XP-12G was produced, having a Turbo-supercharged Wasp engine driving a three-bladed propeller. The XP-12H was a modified P-12D with a geared Wasp engine in place of the usual direct drive type. The P-12I and P-12J were still further experiments, made for engine testing. A small number of P-12Es have recently been modified for fuel-injection Wasp engines and

designated as P-12Ks. They are identical to the Es in all respects but engine installation.

Again we must retrace our steps to pick up the next in numerical order, of the Air Corps pursuits. The XP-13, or the "Viper" as it was called by the Thomas Morse Company that made it, was this company's only venture into pursuit aviation. This ship was of corrugated dural construction and used a 600 horsepower Chieftain engine as its power plant. The narrow chord wings were fabric-covered but controls were of corrugated dural construction. One XP-13A was made as well, differing from the XP-13 in having a wide NACA cowling and a modified fin and rudder. This ship caught fire during a test flight at Wright Field and was consequently destroyed.

The Curtiss XP-14, built at the same time as the Thomas Morse "Viper" is a ship about which little can be learned. It used a Chieftain engine of 600 horsepower however and is said to have been of the same type as the XP-11. The ship was not put into actual service as the project was cancelled by the Air Corps.

Another Boeing monoplane, this time a parasol type, was built as a private venture by that Seattle firm. Known as the Army XP-15 and as Boeing design No. 202, it was wholly of metal. In general appearance it looked like a P-12E fuselage with a single parasol wing, strut braced. This ship was unfortunately wrecked when on a test flight half of the prop blade tore loose and in turn wrenched the engine from its mount. Out of balance the ship became practically unmanageable and the pilot tried to right it before crashing. When about 200 feet from the ground he bailed out and was killed.

The first two-seater on the pursuit list was the B/J P-16, since renamed PB-1 (Pursuit-Biplane). These speedy two-seaters use a 600 horsepower Conqueror direct drive engine swinging a three-bladed propeller. Pilot and gunner sit back to back. Both upper and lower wings are "gulled" out from the fuselage, providing a very aerodynamically efficient mounting. The first model produced, known as XP-16, used a two-bladed metal propeller and had a smaller radiator, these being the main differences between the experimental model and the production type.

Still another Hawk now made its appearance, the XP-17. This time a Wright "Tornado" engine was used. This engine was an inverted V-12 air-cooled model and developed 600 horsepower. It proved to be inferior to other engines in use and further development stopped. It will be seen that Curtiss has tried almost every make of engine in their Hawk pursuits, which undoubtedly accounts for their high state of development at present in our Army and Navy.

Very little is known of the XP-18 pursuit other than that it is a Curtiss product with a V-1560 engine of 600 horsepower. Both this and the XP-19 are true "mystery ships." The XP-19 was not actually finished in fact, the contract being cancelled before completion.

The YP-20 Curtiss Hawk used a 575 horsepower Cyclone engine, giving it a top speed of 193 miles per hour and an ascent to 10,000 feet in 5 minutes. Pants over both landing wheels and tail wheel and a general cleaning up of the Hawk design made possible this increase in speed. As has been noted this ship was a converted XP-11. Although showing good speed the P-20 type has not seen active service.

Curtiss continued along these same lines in designing the XP-21 Hawks. Two were made, one being a converted XP-3A, and the other being made from a service P-3A.

One of the prettiest Hawks built by the Curtiss people was the XP-22, which was actually the forerunner of the successful P-6E. It was almost identical to the production P-6E but had a faired-out belly, smaller radiator, tail skid in place of wheel and slightly lower landing gear. Experiments were also run on this job equipped with a narrow ring cowl, strangely enough, in which were grouped the prestone and oil radiator. Top speed of this ship was approximately 200 miles per hour.

One of the most interesting Curtiss designs was the XP-23 pursuit. This Hawk was the first and only Hawk to use a full monocoque metal fuselage as well as cantilever tail surfaces and metal plate ailerons. As originally produced, a side type Turbosupercharger was mounted but later this was removed and the name changed to YP-23. Speeds on this job were somewhat below that for the P-6E however, due most likely to the rather heavy construction employed. Metal skin construction had not reached the high state of development it is in today at the time the P-23 type was built. This ship, the YP-23, could climb to 10,000 feet in 6 minutes and 18 seconds and had a cruising speed of 178 miles per hour. The accompanying photograph is thought to be the first illustration of this ship to appear in print.

The first low-wing pursuit made its debut with the appearance of the Detroit (Lockheed) XP-24 two-seater. This all-metal cantilever monoplane mounted a Conqueror V-1570-C engine, which gave it a top speed of 214-5 miles per hour. Total weight of the ship was 4,360 lbs. The famous Clark Y airfoil was used. While this ship put up excellent performance in its unloaded stage, it was said to be loggy and slow with full military load. Reports have it that this ship literally flew apart in mid-air during a test dive, although actual confirmation is lacking. Many construction and design features are apparent in the new Consolidated PB-2A and P-30 pursuits that were first seen in the XP-24. Only the one XP-24 was built.

A ship almost identical to the P-24 was made by Consolidated and designated as YIP-25. It, however, used a geared Conqueror engine, alternately supercharged or unsupercharged. The landing gear was of the fold-in retractable type, disappearing completely into a well in the wing and being covered by a flap on the oleo strut. The YIP-25 proved to be an excellent general type and by virtue of its records 4 P-30s and 50 PB-2As have been made.

The Boeing P-26 types form our main pursuit groups today. First designated as XP-936, three low-wing pursuit planes were contracted for by the Air Corps. The Boeing Company made a record in having all three ships flying within a few months after designs were approved. An order was given for 136 of the P-26A type single-seaters, as they were named. It is interesting to note at this point that although the original design for the P-26A called for flap installation, none were fitted until over 100 had been made minus wing flaps. At that time it was decided to equip all of them with these "air brakes" so in groups of 5 they were all ferried back to the factory for modifications. In all only 109 P-26As were made, the rest of the contract being made up of two P-26Bs with fuel-injection engines, and 25 P-26Cs with longer engine mount and general improvements. Although no actual data on the P-26A have been released by the Air Corps, its export prototype, the model No. 281 Boeing, shows the following performance: Top speed 235 miles per hour, cruising range with full load 1145 miles at 208 miles per hour, and absolute ceiling 29,000 feet. These figures are most remarkable when we stop to realize that single-seaters during the late war had a range of perhaps one or two hours at 100 to 120 miles per hour.

Two air-cooled pursuits were made by the Consolidated Company as experimental projects. The YIP-27 and YIP-28 were both of the P-30 type but used Pratt and Whitney Wasp engines. Both of these ships were cancelled as service testing projects and have not been put into production.

One of the cleanest pursuit planes to appear in late years was the XP-940 Boeing single-seater. Now known as P-29 types these all metal cantilever single-seaters have very high top speeds, considering their engines are relatively small 550 horsepower Wasps. Three P-29s were built, one YP-29, one YP-29A, and one YP-29B. The YP-29 has a full cockpit enclosure and wing flaps while the YP-29A has an open pit and P-26 type tail wheel. The YP-29B has wing flaps and a half fork type tail wheel. It is interesting that the YP-29, while on a strictly routine flight, averaged over 250 miles per hour from San Diego to Los Angeles, California.

The Consolidated P-30 has from all indications proved itself to be the world's best two-place pursuit. Four of these fast monoplanes were purchased in 1934 for testing and as a result of these tests an order for 50 of the type PB-2A has been given to Consolidated. Top speed of the PB-2A is said to be in excess of 250 miles per hour. Power is supplied by a 700 horsepower Conqueror engine.

The Curtiss "Swift" XP-934 was a radical change from the biplanes made by Curtiss for so many years. This all-metal low-wing ship was equipped with slots, flaps and all of the known speed arresting

SEE OUR AD PAGE 4

gears. A geared Conqueror engine of 650 horsepower gave this job a top speed of approximately 240 miles per hour. Two guns mounted on the fuselage sides fired through the propeller arc. Provision was made for carrying an auxiliary gas tank or in its place a large bomb.

At the present time other monoplane pursuits are being developed for our Air Corps, among them are ships made by Vought, Consolidated, Curtiss, Seversky and others. The Vought is said to be a radical departure from other Vought ships. No data are available on the Consolidated job but it is known that the Curtiss entry is a low-wing all metal craft with a retractable gear and fully covered cockpit. The Seversky pursuit resembles the famous two-seaters made by that company but has a semi-retractable landing gear. A 930 horsepower Cyclone engine gives it an estimated top speed of 300 miles per hour. Contracts for these ships are due to be awarded late this fall.

Gas Lines

(Continued from page 17)

immediately.

In last month's "Gas Lines" we showed a tailless airplane which we believed at that time to be the first flying wing to be produced. However it seems that we have suddenly been flooded with information concerning experiments with other wings by various gas model builders. One of the most unusual and which we believe may be the first flying wing to be produced and flown, is the one in picture No. 7. It was built and is the result of long experiment by Andrew Borysko of 1485 East 96th Street, Brooklyn, New York. Mr. Borysko passes on some interesting information concerning it.

"Two summers back I started to build a tailless gas job. At first I did a bit of flying with the wing as a glider so that the location of some of the forces could be determined. Towline and hand launching were used. Once the wing broke in half in an unfortunate accident. Another time while being flown as a kite in a gale, I foolishly let her go and she ploughed into a poplar while going down wind. The crash sounded like an explosion to me and for a while I felt kind of sick. After getting her out of the tree we saw she wasn't so bad and in a few days the model was back in flying condition. During the fall we flew the tailless with a Brown used as a pusher. This continued right on through the winter. Once in a while we had to pour a little gas on the engine and set it afire to get it started. Flights were pretty stable but there was a tendency to spiral when too much power was used when the model was set for tight turns.

"The model then weighed 3 lbs., 14 ounces. Wing with fins attached weighed 1 lb., 8 ounces. Span from wing tip to wing tip is 7 ft., 1", chord 20". Length is 4 ft. During the spring I increased the fuselage depth, thus lowering the C.G. in relation to C.P. This structural change made the model nose heavy which necessitated adding some lead ballast to the tail wheel which further lowered the C.G., so that now the model weighs 5 lbs., 6.5 oz. The Brown was removed and replaced with a Mighty Midget. The model still has a decent climb and seems to be more stable with the added weight.

"The fuselage has the required NAA cross-section. If further activity is shown along the tailless line perhaps the NAA should adopt a special ruling for center-section cross-section of tailless craft."

S. W. Lamberg sends us further information on this ship. He says:

"It is a wonderful performer and has a steady, flat glide. The sweepback on the wing is forty-five degrees on each half. The model is constructed entirely of balsa, covered with bamboo tissue.

"One morning the ship made fourteen flights, the best time of which was two minutes, eighteen seconds with about 3/32 ounce of fuel. From an altitude of 200 feet the glide lasted for one minute, thirty-nine seconds."

More pictures and information will be given next month concerning this job.

It seems that Wichita, Kansas, noted for its large airplane activities and manufacturing, is becoming model conscious in a big way. Mr. Leo Rutledge of "The Wichita Eagle" of this city, has sent us considerable information concerning the gas model activities there.

Mr. Rutledge is now directing the activities of many of the model builders in Wichita. In picture No. 8 he is shown describing some of the features of the KG-3 which he built to a group of interested model fans. Mr. Rutledge has made an unusually fine job of this model. The workmanship is very beautiful indeed. He tells us something about his experiences with it, as follows:

"My KG-3, which was built from plans in MODEL AIRPLANE NEWS, has given a good account of itself and all that I could ask of a good model. On its first flight of 10½ minutes it was under power eight minutes, climbed to 500 feet and made a perfect landing in the middle of a wheat field one mile away from the take-off. It has only had two minor crack-ups.

"There are several gas models under construction here. I am building the T.D. coupe from the plans in the October issue of your magazine."

Mr. Rutledge is to be commended highly for his work. At present he is planning to form a large chapter of the International Gas Model Airplane Association at Wichita.

A remarkable flight was made recently by Mr. Reginald Denny, the well known motion picture actor who is now exceedingly active in gas model building and flying. A picture of Mr. Denny, his helpers and the little ship is shown in picture No. 9. Left to right they are: Mr. James Blacton Jr., manager of the Reginald Denny Industries; Jackie Cooper, famous screen actor; Reginald Denny; Freddie Bartholomew, also of movie fame; Reginald Denny Jr. and Joe Nikrent, National Aeronautic Association timer.

We will let Mr. Denny tell you the story of the flight himself. It is:

"On Sunday, September 20th, at Metropolitan Airport, Van Nuys, Calif., a stock Reginald Denny model made a sustained flight under power of 1 hr. 47 min. 6/10 sec. Although not conforming entirely to N. A. A. gasoline restrictions, the timing was done by Joe Nikrent official N. A. A. timer, and was an N. A. A. sanctioned flight.

"The model has a span of 6 ft. 1 in. and a wing chord of 10 in. with an all over length of 44 inches. Normal weight of the plane is 3 lbs., but with the extra sized gas tank and heavier battery, the weight for this flight was 5 lbs.

Other persons at the field were Mr. E. G. Bern of American Airlines and Mr. Victor Fleming, an M.G.M. director.

Mr. Allen Turner of 2025 Eastern Parkway, Brooklyn, New York, who is leader of I.G.M.A.A. Unit No. 1, heads a group of builders who are extremely active and progressive. They call their flight squadron "Turner's Flying Circus." Picture No. 10 shows their group of planes and members. This unit makes raids on all the contests in the vicinity of Brooklyn and usually carries away one or more of the prizes. It shows what a well organized unit can do.

Picture No. 11 shows two interesting ships exhibited at one of the contests held at Gotch Airport 13600 South Western Avenue, Los Angeles, California. The contests held here under the leadership of Mr. Gotch are extremely interesting and helpful to gas model fans. The outline of the contest, which follows, will give you an idea as to its character and size.

There were 10,000 spectators and 131 contestants. The duration of the Precision Contest was two hours with 262 flights made within these two hours.

Contests at the Gotch Airport are a regular occurrence. It appears that very much greater interest is aroused among the people in California in gas model events than in the east. The east is still hoping for a break from "their public".

Mr. Irving Hoyser of 414 South Crouse Avenue, Syracuse, New York, writes and tells us of the success of Edward R. Guth of Liverpool, New York, R.F.D. No. 1, with his 2/3 scale KG model. It is shown in picture No. 12. Guth's little sister is standing beside the job to show its comparative size. Even young ladies are becoming air-minded early in life these days.

Mr. Guth has written us concerning his experience with gas model building, so we will let him tell you something about his work. He says:

"About ten weeks ago I suddenly got 'gasitis' and described to build myself a gas buggy. After about a week of serious thought I decided that a hybrid KG would fill the bill, so I went to work for better or for worse. I scaled the model 2/3; changed the ratio of the wing and rudder areas, wing construction, stab, construction, and anything else that looked too formidable to construct, without months of hard labor. I

was, however, especially careful to place the motor, stab, and wings identical to the design of the KG. From outward appearances it is an honest to goodness KG. My labors finished I placed a Baby Cyclone in the nose and proceeded to the airport to test it.

"Space doesn't permit a description of the labors that I have put into the model during the last month to finally get the 'bugs' out of the model.

"By the time that the New York State Fair Model Meet came along she was truly flying like a champion. The model, which has a six foot, eight inch, wing span, weighed in at four pounds and seven ounces. On her first flight she clipped off 17:17 on the 33 c.c. of gas, coming down with about two minutes of gas in the tank. On the next flight she flew 42:30 to win the meet. I was fortunate to only break props on each flight, as Syracuse Airport is not intended for gas models."

Mr. Don G. McLeod, Secretary-Treasurer of the Model Aeronautical Research Bureau of 932 Ingersoll Street, Winnipeg, Man., Canada, tells of the first successful gas model contest held in Canada at Winnipeg on September 7th. Picture No. 13 shows a group of the contestants with their ships. The contest was a huge success and as Mr. McLeod puts it, "very enlightening to all contestants". The results of the contest are:

Tom Smith	13 min. 44 secs.
Art May	3 min. 54 secs.
Wilf St. John	2 min. 54 secs.

Other contestants were: Don McLeod, Boyd Moore, Will McLeod and Gordon Kemp. The contest director was Mr. J. W. May and the other officials were M. E. Pincock and A. H. May.

R. W. McKee of 1522 Ridge Avenue, Zanesville, Ohio, has been very busy trying his hand at a gas job with the help of several of his friends. He undertook to build the KG. How well he succeeded is illustrated by picture No. 14, which shows a shot of the KG taken as it was coming in for a landing. The model is approximately four feet off the ground and ready to "sit down". This model is upholding the reputation of the KG for steady flight, as you can see. It certainly resembles a big ship in the manner in which it is coming in in a flat general glide. The job has a ten foot span and is powered with a Brown Junior motor.

It appears that the gas model craze has found its way to Russia, as picture No. 15 indicates. It shows Timofei Balashev with his model airplane equipped with a benzine motor at the All Union Conference of airplane modellers in Krasnodar (Azov-Black Sea territory), where ten airplane models with benzine motors were on display.

No information concerning the flying qualities of these ships has been received. Word will be given to you concerning them as soon as possible.

UNIT NEWS

Philadelphia, Pa.

The PGMA held its first meet Saturday, September 26, at Northeast Airport, Philadelphia. Seventeen ships turned out to make the meet a successful one. The first prize, a pair of air wheels, was won by Jack Schwartz, with a flight of 7 minutes, 38 seconds. Second prize, also a pair of air wheels, was captured by Bill Krames, whose ship flew three minutes, 40 seconds. Third and fourth prizes were airplane rides, donated by the management of the airport. Third place was won by Gerald Obschleger with a 2 minute, 32 second flight. Fourth place was won by the Kapral twins, Joe and Tom. We don't know which one got the ride! An amusing incident occurred when the plane flown by Hurleman, son of the motor manufacturer, landed on a turkey farm. When Hurleman tried to get his ship he was greeted by a woman with a shotgun who would not let him touch the plane. He was however given permission to use the phone, so he called the police, who obtained the plane for him!

Pittsburgh, Pa.

Mr. Robert K. Allen of 7041 Frangstown Avenue, Pittsburgh, Pa., leader of Unit

No. 3, writes that gas model activity is expanding from Pittsburgh to all parts of western Pennsylvania and even into Ohio. The builders of all of these jobs are affiliated with Unit No. 3. Local contests are held regularly.

Purpose of the International Gas Model Airplane Association

In order to clarify in the minds of members the purpose for which the International Gas Model Airplane Association was established, we state the following:

First of all, the policy of the I.G.M.A.A. is governed by the intent on the part of the Association and its officials to benefit all of its members, not only one or two or any small group at the expense of the whole organization. In setting up the organization and in making the rules, the influential factor is that all of its members may receive information from the individual members of the organization.

In this way all of its members may benefit from the findings of any one of the members. It helps a free flow of information through which all may be helped.

In order to have the organization fulfill its purpose we are looking to all members, unit leaders and others connected with it to cooperate and uphold the decisions of the officials and rulings of the organization, especially at contests. If there are any objections to the decisions or the procedure at any particular gathering or contest, we wish the organization members to state their opinions and objections in an orderly and intelligent manner. These objections will then be considered carefully and a meeting of the council and unit members will be called if necessary or if demanded, to decide upon any pertinent questions. There is no place in the organization for those who will not follow this procedure.

Airways—Here and There

(Continued from page 28)

Stick Model Event *(JUNIOR)*

1. George DeLaMater, Oneonta, N.Y. 3:27.4

(SENIOR)

1. Leonard Zeldow, Binghamton, N.Y. 22:10.6

Fuselage Model Event *(JUNIOR)*

1. Carl Moody, Hornell, N.Y..... 7:45.0

(SENIOR)

1. Ira Fralick, Syracuse, N.Y..... 33:10.2

Gasoline Powered Event

1. Ed Guth, Syracuse, N.Y..... 42:30

(OPEN)

1. Colin Edwards, Oswego, N.Y..... 6:30.4

Exhibition Scale Model Event

1. Louis Casale, Syracuse, N.Y..... 99 pts.

The second Air Ways Club Design Contest has been under way for one month. Those who are interested in entering this contest will find full details of it in the November issue. All entries for the contest must be in this office, MODEL AIRPLANE NEWS, 551 Fifth Avenue, New York City, by midnight, November 21st.

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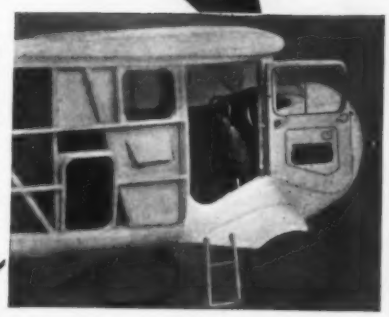
3/4" SCALE FLYING MODEL

THE MOST COMPLETE KIT OFFERED MODEL BUILDERS TODAY **$3.00**

Megow's new ¾-inch scale models leave nothing to be desired in completeness or perfection of detail. Every precaution has been taken to make construction simple and durable. Months of experimental building and planning are behind the accuracy, the flying ability, and completeness of these new "Plane-of-the-month" Kits. Read the description of what the new ¾-inch scale Kits contain and then compare the prices with other makes.

Complete detailed plans and photos of skeleton and finished models. Finished flying prop and blank for scale prop. Oversize quantities of cement, tissue cement and colors. Correct colors in paper. Shaped wheels. Aluminum drag ring. Heavy celluloid for cabin windows. Movable controls on tail and wings. All insignia. Description and material to complete cockpit including blocks to make pilot's figure. Upholstered seats, hinged cabin door.



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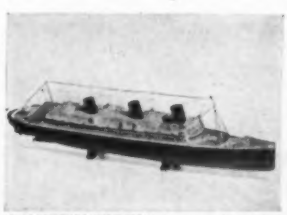
And here are more star numbers by Megow



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Robt. A. Williams, Uniontown, Pa.
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Clair R. Kinney, Endicott, Wash.
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SEE OUR AD ON CENTER PAGE OF THIS ISSUE ALSO

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One of the Great Silver Fleet. This twin-ruddered, twin-motored beauty, complete kit contains absolutely everything necessary to build it except the liquids, which of course means all the highest quality of strip wood, all the necessary curved parts printed on flat sheets ready to cut out, all wheels supplied, covering tissue, blocks for pilot, etc., etc., and last, but most important, a full size large C-D drawing and instructions. This twin-motored beauty which has rubber motors protruding through the wings behind the nacelles, makes an imposing sight in flight, colored all silver. Span 27⅝". Kit D-65, complete except liquids, post-free..... **$2.25**

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Famous U.S. Fighter. Span 21¼". Sug. col.: olive drab, red and white. Kit D-3, only **75c**

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Popular fighter. Span 15". Sug. col.: yellow and olive drab. Kit D-8, only..... **65c**

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Excellent flyer. Span 13¼". Sug. col.: National cream color. Kit D-9, only..... **40c**

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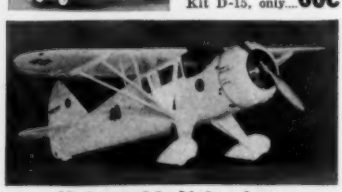
Span 14⅛". Sug. col.: orange, green & white. Fine flights. Kit D-15, only.... **60c**



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Race model. Span 10". Sug. col.: all white. Kit D-18, only.... **30c**

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Will R.O.W. Span 13", length overall 14½". Sug. col.: silver and blue. Kit D-19, only..... **65c**

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Very popular. Span 14⅛". Sug. col: yellow, O. drab (or blue), Kit D-23, only.... **65c**

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Span 20⅛". Sug. col.: brilliant red and cream. Kit D-24, only **85c**

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Span 15½". Sug. col.: orange, black. Excellent for beginners. Kit. D-26, only.... **35c**

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Easy for beginners, span 18". Sug. col.: red and silver. Kit D-40, only..... **60c**

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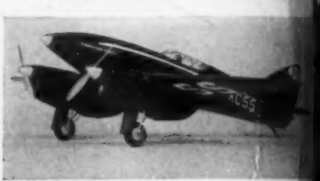

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